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CONSIDERED

HASSALL

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Où la brise est plus douce et l'oiseau plus léger?"

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SAN REMO

CLIMATICALLY AND MEDICALLY

CONSIDERED

BY

ARTHUR HILL HASSALL, M.D. Lond.

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AND DISEASE' 'THE URINE IN HEALTH AND DISEASE'
AND VARIOUS OTHER WORKS

WITH NUMEROUS ILLUSTRATIONS

NEW EDITION

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1883

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15

'Connais-tu le pays où fleurit l'oranger,
Où la brise est plus douce et l'oiseau plus léger,
Où rayonne et sourit comme un bienfait de Dieu
Un éternel printemps sous un ciel toujours bleu ?'

TO

SIR GEORGE BURROWS, BART., M.D.

AND

RICHARD QUAIN, M.D., F.R.S.

IN GRATEFUL RECOLLECTION OF MUCH PROFESSIONAL CARE

AND KINDNESS DURING A LONG AND SEVERE ILLNESS

This Work is Dedicated

BY

THE AUTHOR

PREFACE.

THIS work may be regarded, so far as San Remo itself is concerned, as a new edition of my work entitled, 'San Remo and the Western Riviera.'

In the present book, however, everything relating to San Remo is treated much more fully and exhaustively. The General Features of the Climate, the Natural History of the District, and, above all, the Medical Characteristics of the Climate are described at considerable length—this last being the most important portion of the work. In it the suitability or otherwise of the climate in a great variety of diseases is fully discussed and considered.

I have now the pleasing duty of acknowledging the obligations I am under to the following for valuable aid most kindly rendered. To Dr. Günther, for the identification of some of the Mediterranean Fish; to Mr. Waterhouse, for the names of some Insects; to Mr. Edgar Smith, for the names of some of the Marine Shells; to Colonel Cox, for the list of Land Shells found around San Remo; to Mr. Goodchild, for the list of Fossil Shells found in the pleiocene formation at Bordighera; to the Rev. G. L. Fenton, for the MSS. of the paper by his son, the late Mr. George F. Fenton, on the Reptiles of San Remo; to Monsieur Pierre Millière, the distinguished Lepidopterist of France, for his highly interesting and valuable list of the Butterflies and Moths of the Riviera; to Mr. John Congreve, for his list of Butterflies and Moths found in the neighbourhood of San Remo; to Mr.

Crump, for the list of Lepidoptera found by himself and sons, as well as for other information; to Mr. Heilmann, of the Museum of the Hôtel de Ville at Cannes, for the names of certain curious Grasshoppers, and for other information; to Signor Cav. F. Panizzi, for the names of some Alpine Plants; to the Rev. Clarence Bicknell, of Bordighera, for his most interesting and useful classified list of most of the principal Flowering Plants found between Ventimiglia and Taggia; to Monsieur Dognin, for the list of Tropical Plants, the fruits of which ripen in his renowned and beautiful garden, Camille-Amélie at Cannes; to Baron von Hüttner, for an analogous list of Tropical Plants, growing in his highly interesting garden at San Remo. My most cordial thanks are also due to Mrs. Cox, to whose skilful pencil I am indebted for the drawings of the plants engraved in this work; to Miss Jay; to Colonel Cox, for the photographs of the butterflies figured in this book, and which were made under his direction by Signor Scotto, of San Remo. I have further to thank Mr. Evans, of Ampton Place, for the care and skill with which he has executed the wood-engravings, and also Mr. Edwy G. Clayton, for searching through a number of works on Natural History at the Library of the British Museum.

Finally, I would acknowledge the great assistance I have received from my wife who, on this occasion, as during the preparation of my former work, 'San Remo and the Western Riviera,' has been my kind amanuensis and able helper.

ARTHUR HILL HASSALL.

VILLA BRACCO, SAN REMO:
July 1883.

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SAN REMO.

CHAPTER I.

The Riviera—Situation of San Remo—The Bay—The Sheltering Hills and Mountains—History—The Old Town—Its Architectural Peculiarities—The New Town—The East and West Suburbs—The Port—The Sea Baths—The Campo Santo—Sanitary Condition of the Town—The Water Supply—Analyses of Fountain and Well Water—Necessity for a New Supply—Rain Water—The Drainage—Town Refuse—The San Remese—Servants—Washing—Dress of the San Remese—Walks and Drives—Amusements.

THE lovely and highly-favoured district extending for about 117 miles along the north shore of the Mediterranean from Nice to Genoa is known as the Western Riviera, Riviera di Ponente, and Genoese Riviera, Riviera di Genova, and the scarcely less lovely region lying between Genoa and Lucca, by the name of the Eastern Riviera, Riviera di Levante. The north shore of the Mediterranean, from Marseilles or Toulon as far as Cannes or Nice, has by some been included in the Riviera, since the configuration of the land near the coast resembles to some extent that of the true Riviera, although the mountain protection afforded is much less complete, and the climate consequently much colder. Indeed, the sanitary interest and value of the whole of the Riviera is mainly centred in the district lying between Nice (or let us say Cannes) and San Remo, a space which includes a sea frontage of about fifty miles. In this small space lie the world-known health resorts of Cannes, Nice, Monte Carlo, Mentone, Bordighera, and though last, not least, San Remo. They are all placed thus near together, because the surrounding protecting hills and mountains afford the most complete shelter to be found in the Riviera, and are at the same time more picturesque and beautiful than elsewhere in the district. In the Western Riviera, the only place to the west of Cannes at present having any pretensions to be regarded as a health resort is St. Raphael, and this is better suited for a summer than a winter station; while east of San Remo there are but Alassio, yet in its infancy, and Pegli, a

suburb of Genoa. In the Eastern Riviera the two chief resorts are Nervi and Spezzia.

Now, the two Rivieras consist of a comparatively narrow strip of land extending along the north shore of the Mediterranean, facing south, and more or less completely protected to the north by hills and mountains: the coast or sea-line of this strip is indented by a series of picturesque bays, on the shores of the more considerable of which towns are usually situated. These bays are guarded by headlands more or less bold, and having usually an elevation of several hundred feet. At a little, though variable, distance inland from the coastline are the Olive-clad hills mostly arranged in a semi-circle, bounded on either side by the projecting headlands. Behind these hills rise mountains, which attain some three or four thousand feet in height, some devoid of vegetation, but many clothed to their summits with forests of pine trees. These mountains throw out numerous spurs, which take a southerly course to the sea; the more considerable of these spurs terminate in the protecting headlands of the several bays, while the smaller spurs form the steep ridges which separate the numerous valleys of which there are usually several around each town. Through each of these valleys, the size of which varies greatly, and some few of which pierce the mountain chains, flows a stream; these streams become much swollen and discoloured by earthy matter in the rainy season, and carrying with them much *débris*, they rush along to the sea with great swiftness and force; at other times the streams dwindle to mere narrow rivulets, while during the summer months the water disappears altogether, nothing remaining but the dry, stony bed, apparently far too wide and large for the volume of water it is destined to discharge into the sea. Of all the many torrents, streams and rivers which empty themselves into the Mediterranean from Cannes to San Remo, the only permanent or perennial ones are the Siagne at Cannes, the Var and Paillon at Nice, and the Roya at Ventimiglia; and these are rendered perennial, not by the rainfall but by the melting of the snow on the higher Alps.

Behind the mountains already referred to lie the Maritime Alps: these reach an altitude of some seven or eight thousand feet, and contain embedded in them many charming valleys: this chain of mountains begins at Nice and ends at Ventimiglia, and is succeeded by the Ligurian Alps, which extend as far as Genoa, where the Apennines commence.

Then, lastly, still more inland and further to the north rise up in all their beauty and grandeur the true and snow-clad Alps, lovely glimpses of which are obtained where there are breaks in *the continuity* and height of the Maritime Alps, as on looking up

the valley of the Nervia at Bordighera, and Roya at Ventimiglia, and also in driving from Cannes to Antibes, as well as in some other situations.

It thus appears that the best of the health resorts of the Western Riviera are triply protected—first, by olive-clad hills; second, by the mountains next in order; and thirdly, by the Maritime and Ligurian Alps—behind these being the snowy Alps. These hills and mountains all act as ramparts or barriers against the northerly winds, and so contribute powerfully to render the Riviera exceptionally warm. This effect is however to some extent counteracted by the snow-capped Alps. The air in passing over these is rendered exceedingly cold, and this refrigerated air sensibly affects at times, especially in winter, and in the absence of the sun, the temperature of even the most protected parts of the Riviera.

On the whole, therefore, it is evident that the Riviera is wonderfully protected, and its chief towns and cities even more surprisingly so; being placed in the curves of beautiful bays facing south, sheltered by bold headlands and backed by ranges of lofty mountains. Human ingenuity and skill could not possibly have devised, even in imagination, a scheme of more effective protection.

San Remo, a town of 15,000 inhabitants, is situated in the Western Riviera, in a bay of the far-famed Gulf of Genoa, about four miles in breadth; its latitude is 43° 48′, longitude from Rome 4° 43′, and it faces the south: it is 16 miles from Mentone, 31 from Nice, and 85 from Genoa.

The bay describes a considerable segment of a circle, and, viewed from a height, it is seen that it is subdivided into four smaller bays. It is bounded by two bold headlands, Capo Verde to the east, 350 feet, and Capo Nero to the west, called by some Cape-Pin, about 800 feet in height. From these promontories the mountains gradually rise until, behind the town, they reach an altitude in Monte Bignone of 4,270 feet.

The first sheltering barrier is formed by a series of seven hills, intersected by valleys, through which flow small streams, or, as they are here termed, torrents: these valleys run from north to south, and terminate in every case on the sides of the mountains in blind extremities. The hills and valleys are densely clothed with Olive trees, and in some of the valleys are groves of Lemon and Orange trees.

This first barrier of hills is succeeded by the range of mountains already referred to. These are not thrown up into sharp jagged peaks as at Mentone, but form an unbroken protecting chain and are mostly fir-clad.

Behind this second range lies a third, the Alpes Maritimes,

with an elevation of 7,000 and even 8,000 feet; these, however, are not visible from the town itself.

Thus San Remo is enclosed and protected by a triple barrier of hills and mountains.

The surrounding mountains describing a considerable segment of a circle, and extending some distance inland, a large area is thus enclosed, forming a noble and well protected site, sufficiently extensive for the erection of a large town, that already existing being of no mean dimensions.

Dr. Walshe has so graphically sketched in a few words the chief topographical features of San Remo and its amphitheatre, that his description may here be quoted with advantage:

'Lying in a deep bay looking due south, the town, rising in a pyramidal form from the shore, is protected on the north by three successive groups of hills, ranging in height from 500 to 8,000 feet, none of them cleft by torrent beds, and all free from broad gorges likely to give passage to the winds; hence the tramontana passes over the town to seaward, while two promontories shelter the bay to the east and west. Yet further protection is afforded by groves of Olive trees, and at the highest level by Pine forests.'

A very good view of the hills and mountains surrounding San Remo may be obtained from the extremity of the pier or Molo, which forms the western boundary of the harbour, but a still better view, from the sea at a little distance from the shore. There are also fine views from the two capes. From Capo Verde on the east not only is the town of San Remo with its surrounding mountains seen, but to the north the towns of Poggio and Bussana, and along the shore eastward Arma, Riva, and San Stephano; while from Capo Nero to the west, Bordighera, Monaco, the lighthouse of Villefranche, and sometimes even the Esterels, are plainly visible. In very clear weather, especially at sunrise and sunset, the picturesque and snow-capped mountains of Corsica come into view; this island lies a little to the south-east of San Remo and is about 80 miles distant. That it should be visible affords a striking illustration of the dryness and clearness of the atmosphere.

No one can fairly judge of San Remo who has not obtained a good view of its bay, its encircling mountains, and the extensive and sheltered area which these enclose.

Now it is to the surrounding mountains and hills that the special features of the climate of San Remo are mainly due, these influencing alike winds, rain, and temperature.

By its triple range of hills and mountains, the latter unpierced by valleys through which wind can find access, San Remo is efficiently protected from the north, and to a considerable *extent from* the north-west or Mistral, and north-east or Bise

winds, as also in part from the east and west winds but, since the town faces the south, it is of course open to the southerly winds. It is thus that the mildness of the winter climate of San Remo is in part explained and ensured.

San Remo is a very ancient town and was formerly one of much importance. Its early history, given in great detail by Girolamo Rossi in his 'Storia della Città di San Remo,' is truly remarkable and full of interest.

On the spot where San Remo now is, there formerly stood a town, probably founded many centuries ago by the Greeks, and named by them Leucotea. When the Romans became the conquerors of Liguria they changed the name of Leucotea to Matuzia, after Matuta, goddess of the sea.

The submission of Liguria to the Romans occurred under Augustus, B.C. 12.

The first Christian missionary who appears to have been sent to Matuzia was Ormisda; he was succeeded by his pupil, San Siro, after whom the cathedral of San Remo is named; and he again, A.D. 600, by Bishop Romolo, who lived for many years at the Hermitage, which is named after him, and where he died: his memory is still held in great veneration by the people, and the day of his death, October 13, is kept as a festival by the San Remese. He was buried in Matuzia, of which he was regarded as the patron saint, but in 876 his remains were removed to the cathedral of Genoa, in order to save them from desecration by the Saracens who came from Spain, and who at that period had obtained possession of the whole of Liguria. Prior to the invasion by the Saracens the country was overrun by the Goths and Vandals.

The Saracens held possession of Liguria until the year 972; the inhabitants of Matuzia in consequence of the invasion fled for refuge to the mountains, and only returned to their town after the expulsion of the Saracens by Count Guglielmo of Provence. They then rebuilt it, and named it San Romolo after their patron or guardian saint; this happened, according to Girolamo Rossi, in 979.

San Romolo became a free Republic about 1200; but, not being strong enough to maintain its own independence, it afterwards formed an alliance with Genoa. In 1297 San Romolo and Ceriana were sold by one of the Archbishops for 13,000 lire to Oberto Doria and Georgio di Mari; and in 1350 the Dorias, having become much impoverished by constant warfare, sold their rights to San Romolo to the Genoese Republic. The town then continued to flourish until the end of the 15th century, about which time its name was changed to San Remo. According to Rossi, the reason for this change of name is unknown, but the late Signor Bonetti believed *that* 'Remo' is a corruption of 'Eremo,'

or 'Hermitage,' the patron saint having long lived in the Hermitage near San Romolo.

In the 16th century the town was visited by the plague, and afterwards suffered from attacks by Turkish pirates; these in 1548 were driven away for a time by Luca Spinola, who defeated them in a battle fought near Verezzo, the spot being still marked

FIG. 1.

by a cross, Croce di Parà. The anniversary of this battle, August 7th, is still observed by a procession to the church of San Donato at Verezzo. Some time afterwards the Turks recommenced their attacks, and protecting towers were erected, some of which are still to be seen in different places along the coast. Next, the *town in 1625 passed* into the hands of the Duke of Savoy, but re-

verted to Genoa at the end of the 18th century. During the wars of the Spanish Succession it was frequently attacked, sometimes by the French and Spaniards, who were in alliance with Genoa, and at others by the Austrians and English. In 1797 a Republic of Liguria was formed, San Remo constituting a part of it under the name of the 'District of Palms.' Later the town became a sous-préfecture under Napoleon I., but on his fall Liguria was incorporated with the kingdom of Sardinia, and now belongs to Italy.

It thus appears that the town of San Remo has undergone many changes and vicissitudes, and that the ancestors of the present inhabitants truly lived in troublous and uncertain times.

The traveller cannot fail to notice that nearly all the old towns on this coast are built on the steepest hills. The reason of this is that they might the more readily be defended from the piratical attacks to which they were formerly so frequently subject. Thus situated the space was necessarily in most cases very limited, and the streets, in consequence, were made very narrow, and the houses at the same time exceedingly lofty. These circumstances therefore influenced very much the architecture of such towns. But there was still another reason, which was not without its influence on their construction—namely, the liability to shocks of earthquakes, which formerly were much more frequent than they have been of late years. This fear led to the strengthening of the houses by throwing across the narrow streets a number of supporting arches, which present in some towns, and particularly in San Remo, a very curious as well as picturesque appearance (Fig. 1).

With these few preliminary remarks we will now enter the ancient town of San Remo, which still retains, after the lapse of centuries, many of its old structural features and characteristics.

The greater part of it is built on the southern slope and sides of the hill which terminates the long ridge which proceeds from Monte Bignone, and divides the East and West Sanctuary Valleys, also called the San Francia and the San Romolo Valleys, the road to San Romolo running on the top: the smaller portion of the town stands upon the west side of the San Romolo Valley. The town consists of sections or quarters, each of these having been formerly approached by separate arched gateways, the arches in most cases being still intact. This arrangement was adopted for better defence, so that, if one of the quarters were captured, the others might still be defended.

On entering the town we find streets so steep that steps have been made to facilitate the ascent; so narrow, and the houses so lofty, that air and light penetrate in greatly diminished amount, and to some of the houses and dwellings scarcely at all (figs. 2 and 3). We also notice very many of the overhanging arches

previously adverted to, and up the walls of some of the houses are seen the long, twisted stems of ancient vines, usually carefully protected for some feet above the ground by masonry, and which, when they have reached the tops of the five- and even six-storied houses are there carefully trained over balconies. Under the shelter of these vines, which even at this altitude bear fruit, the

FIG. 2.

inhabitants sit and enjoy the view of the olive-clad hills, the fir-covered mountains, and the deep blue Mediterranean. Small aqueducts are much used for the distribution of water and are often carried across the streams; one of these may be seen in the old town crossing the San Romolo torrent as shown in Fig. 4.

The town was formerly surrounded by a wall with towers and

possessed a castle; portions of the two former are still standing, and the foundations of the castle are yet visible.

Having thus given a sketch of the position and general features of the old town, this may now be described a little more in detail. Approaching the Via Palazzo from the Piazza Colombo, we notice on the left the pharmaceutical establishment

Fig. 3.

of Signor Cav^e^ Francesco Panizzi, so widely known for his botanical researches, and who is now engaged on the study of the Fungi of the neighbourhood, his labours having already been rewarded by the discovery of several new species. Passing through an archway on the right-hand side of the street we come to the Palazzo di Città, or Town-Hall, where the Syndic, Signor

Bartolomeo Asquasciati and the other authorities have their offices. At the end of the Via Palazzo is the Piazza del Mercato, or market-place; in the centre of this is a large and much used fountain of excellent water and several Plane trees; it is surrounded by many useful shops, while the stalls are well supplied with vegetables and fruit, with poultry, and, in lesser quantities, game and fish.

At the north-west corner of the market-place the back of the Cathedral San Siro is seen, and close to this is the Baptistery.

From this point we may proceed upwards through any of the more curious streets which attract our notice until we reach the summit of the hill: this forms a large level space from which fine views are obtained of the sea and the surrounding hills, as well as of the San Francia and San Romolo Valleys. On the northern part of this space is the Sanctuary of the Madonna della Costa, approached by a broad flight of steps. At the south-east and south-west corners of the Sanctuary are two small cupolas curiously inlaid with water-worn pebbles. The pictures and marbles on either side of the high altar are considered to be good.

On descending from the Sanctuary, and at a little lower level, is 'Il Leprosario,' the former Hospital for Lepers, recently abolished.

From this point the descent to the lower or new town is tolerably easy. Viewed from a distance, towns similarly situated to San Remo present no doubt to the eye a picturesque appearance, nor is this picturesqueness usually diminished by a closer inspection; certainly this is not the case with San Remo, which is one of the most curious and interesting old towns of the Riviera. But for all this quaint beauty and interest the poor inhabitants pay heavily; there is the toilsome daily ascent, the little less trying descent, the difficulty of carrying up water and other necessary supplies; the diminished air and light, and the frequent absence of sunshine, impairing health, and too often inducing disease. These disadvantages and evils are however, in San Remo, less than might have been anticipated, and there is far more light, sunshine, and cleanliness than was to have been looked for; besides the present inhabitants enjoy at night, in their dwellings and in their narrow streets, the inestimable blessing of the efficient light produced by gas and petroleum.

We will now endeavour to give some idea of the newer portion of the town. The old high-road from Nice ran through the narrow street, Via Francesco Corradi, opposite the Sous-préfecture, the Piazza del Mercato and the narrow Via Palazzo; along these all the heavy traffic, including the diligences, which formed, before *the days of the* railway, the only mode of travelling, were obliged to

pass; and in them many of the principal shops still are situated. But now there is a new, broader, more direct, and in every way more convenient road; that portion of it which passes through the town is called the Via Vittore Emanuele, and from it several streets branch off on either side, the whole constituting what may be termed the new town of San Remo. In the Via Vittore Emanuele

FIG. 4.

are many of the public buildings and offices, as well as numerous well-furnished shops of every description. Passing along the street from the western end, we notice in succession the Hôtel National on the left, a little further on to the right the Sous-préfecture, the Maison Fornari and the Hôtel San Remo, which latter stands at the west corner of the Via Andrea Carli. In this street

is the English Church of S. John the Baptist, and of which the Rev. G. L. Fenton has been for many years the Chaplain. At the east corner of this street is the Asilo Corradi, a school built and endowed by Dr. Corradi, a native of San Remo. Further on, in the Via Vittore Emanuele, on the left, is the Pension Suisse, the Hôtel Central, formerly the residence of the Sous-préfet, and a little beyond is the Via Feraldi, leading to the market. A few yards further on is the Via Privata; in this are the offices of the English Vice-Consul, Walter Congreve, Esq., M.A., and Mr. J. Congreve, Land and House Agent. Next to these are some recently opened Public Baths; these are well arranged and very clean, and supply what has formerly been a great want. At the end of the Via Privata is the Palazzo Roverizio, recently converted into the Restaurant Molinari, with an archway leading into the Via Palazzo. Returning to the Via Vittore Emanuele, and on the same side of the way, is the Palazzo Borea, at the corner of the Via Cavour, built in the 15th century, and which originally must have been a handsome building: the lower portion now consists of shops, but the upper part is occupied by the Marquis Borea.

Next is the Via Principe Amedeo, in which is the well-appointed theatre. The Via Vittore Emanuele shortly afterwards terminates in the Piazza Colombo, a kind of market-place, where carts, arriving from the country with provisions, take up their stand.

Returning now to the Asilo Corradi, and on the same side of the way, is the bank of Messrs. Rubino, and the establishment of Mr. Squire, the English chemist, and next to it the new Square and gardens in the Via Umberto. A little further on is the well-known library of Signor Gandolfo, and within a few doors the banking establishment of Messrs. Asquasciati Frères; next the Via Gioberti, in which is the Hôtel des Bains and Hôtel Beau Séjour, and, at the end, the Custom House and Port. Returning to the Via Vittore Emanuele we notice the photographic studio of Signor P. Guidi, whose coloured photographs of the Lemon, Olive, and Eucalyptus trees, as well as of many of the rarer wild flowers, are so extremely beautiful and natural; and lastly, the Hôtel Grande Bretagne. This brings us once more to the Piazza Colombo. The number of shops of all kinds is now so considerable that it would be impossible to enumerate even the principal, but the establishment of Messrs. Ajcardi, stocked with perfumes made from flowers mostly grown in the neighbourhood, may be specially referred to.

It now only remains that a description should be given of the west and east suburbs of the town, in which are situated the principal hotels, pensions, and villas.

Commencing westward, at the Villa Luigia Ponente, on the

left-hand side is the Hôtel des Anglais, then the commencement of the Strada Berigo, and the Pension Quisisana, next the handsome West End Hôtel, and then the Hôtel de Londres, all on the same side of the way. Nearly opposite the Villa Luigia Ponente is the road which leads to the Cemetery, and further on, in front of the Hôtel de Londres, is the Hôtel Pavillon, the Hôtel Palmieri, and the New English Church of All Saints; after the Hôtel de Londres, on the same side of the way, is the site of the Casino about to be erected, and there are several villas very pleasantly situated, but some rather high up; next come the Hôtel Paradis, the Hôtel Damesin, the Hôtel Belle Vue, Villa Tennyson, the residence of E. Lear, Esq., and the Royal Hotel. The hotels occupy excellent positions, and the last-named is succeeded by a number of villas, some near the road, others higher up, at different elevations, and amongst these may be mentioned the Pension Tatlock and Pension Flora. Just before reaching the Villas Bracco is the Scotch Presbyterian Church, and after them is the Giardino Pubblico, or Public Garden, in a very sheltered position facing the south. Although not of any great extent, it yet forms a very favourite walk and lounge for the visitor and invalid; the grounds contain many handsome trees and shrubs, including the Eucalyptus, Pepper, Lemon, Orange, Palm, and some Banana trees which, in favourable years, are said to bear fruit. Many of the trees and shrubs are labelled with the class, name, and habitat—an excellent plan. It is here that the band plays in winter.

Returning to the Hôtel de Londres, and nearly opposite to it, high above the sea and the railway, is the Jardin de l'Impératrice; so named in honour of the late Empress of Russia; beside this is a broad and handsome promenade, which descending is continued to the Via Vittore Emanuele; it is bordered by flowering shrubs, as well as by many Eucalyptus, Pepper, and Palm trees; this walk is well exposed to the sun and sea breezes, is provided with seats, and forms a very pleasant and favourite Promenade. The Hôtel de la Paix is nearly opposite to the entrance of the public garden, next to which, but standing back a little from the road, is the Church of the Capuchins, close to the commencement of the Via Vittore Emanuele. This completes the general description of the western suburb; that of the eastern will now follow, commencing from the Piazza Colombo: on the right is the Couvent de la Visitation, now nearly unoccupied, and after this we come to the Corso Garibaldi, with some fine Plane and Chestnut trees on either side; on the left of the Corso is the Via Francia with at the corner the Church of the Angels, and next, the Ospedale Civico, or Civil Hospital; the Natural History Collection of Signor Panizzi; and a little further on is the newly erected German

Lutheran Church. The Corso Garibaldi extends some distance beyond the Hospital, and ends in what is called the Rondo. In the Corso on the left are the Hôtels de Nice and d'Angleterre, on the right the Home for Twenty Invalid Ladies, in part supported by the contributions of the charitable, and, on either side, numerous villas. From the Rondo, on the left, is first a road which leads to some houses and to the Pension d'Allemagne. Beyond the Rondo is the continuation of the Genoa road, on either side of which are some fine and well-situated villas, as well as the Hôtels Mediterranée and Victoria on the right-hand side; after these hotels come other villas until the San Martino torrent is reached which forms the eastern postal boundary of the town; the Foce torrent, just beyond the West End Hotel, constituting the western boundary.

In addition to the churches already noticed, San Remo possesses many others, as also sanctuaries, and oratories; for notices of which the reader is referred to the 'Guide to San Remo' by Cesare da Prato, and to that of M. Marest; the latter work will be found to contain much useful general information.

It may now be observed that the hotels and villas on the western side of the town stand for the most part on higher ground than those on the eastern side, and are nearer to the sea, consequently they are more exposed to the wind and sea breezes and the air is cooler and fresher. On the other hand many of the hotels and villas on the east side are on a lower level, further from the sea, and the land seaward is covered with sheltering olive trees; hence this side is less exposed to the winds from the sea, the noise of which is less heard, and the air is warmer and moister. I shall hereafter consider more fully these differences, particularly in their medical bearings.

The description of San Remo would hardly be complete without a reference to the railway. The old station was a very shabby wooden structure not at all befitting a town of the size and importance of San Remo, but I am glad to say that since my work on San Remo and the Western Riviera appeared, a very commodious station has been erected. From the station commences a new, broad and handsome street, Via Roma, in which the Post and Telegraph Offices are situated, and this terminates in the Via Ruffini, which joins the Corso Garibaldi. The railway unfortunately runs close to the sea; this is a serious hindrance to the welfare of the town, as it not only prevents the shore from being readily accessible, but it renders the construction of a promenade on a level with the sea at the western side of the town all but impossible, although at the eastern end there is still space left for the formation of that essential improvement, *a broad* and handsome esplanade.

The description of the town of San Remo may be brought to a conclusion by a few remarks relative to the Port and Cemetery.

On reaching the Port from the Via Gioberti, on the right a somewhat dilapidated fort is seen, 'Santa Thekla,' built by the Genoese and now used as a prison. From the back of this a raised terrace or pier runs out towards the sea, and forms the western boundary of the port. This terrace is called the Molo, and is reached by several flights of steps, and from its extremity, as already noticed, a very fine view of the amphitheatre of hills and mountains surrounding the town, is obtained, as well as of the town itself standing out boldly on the side of the hill. On the left of the fort are the Sea Baths; these face the entrance of the port, and here may usually be observed a large quantity of the seaweed, peculiar to this part of the Mediterranean, cast up on the shore, where it often forms in the immediate vicinity of the baths, and for some distance beyond them, a very considerable bank, the water itself being rendered turbid and discoloured by the quantity of seaweed floating in it, and which imparts to it anything but an inviting appearance. The site chosen for the baths is therefore not a good or suitable one; but there is the further objection to be urged against the position, that the water of the harbour is not nearly so pure and fresh as that of the open sea. It is then very desirable that the present baths should be removed to a cleaner site on the seashore.

The seaweed which sometimes accumulates in such large quantities at these baths and elsewhere along the coast contains nitrogen and other fertilising constituents in quantity sufficient to render it valuable; and it is a pity it is not used here, as it is in many other places, as a manure. The fresher the fucus the larger the proportion of albuminous matter present.

At a little distance from the baths, a few small sailing vessels are usually to be seen. Formerly, before the days of the railway, small coasting steamers regularly put into this harbour from Genoa, Nice, and Marseilles, but they have long since ceased to do so. At no time however could the larger steamers call here, in consequence of the shallowness of the harbour. If this could be deepened so as to allow of steamers putting in to the port, bringing luggage, goods, and general merchandise, the prosperity and wealth of the town would be thereby greatly increased. At present, goods coming from England by ship have to be landed either at Marseilles or Genoa, and to be transmitted thence by railway at a greatly increased cost and with vexatious Custom-house delays.

The port is well protected to the east, but is much exposed on the south-west. Some extensive works are now being carried on with a view to the formation of a breakwater. This

when completed will materially increase the size of the harbour and the depth of the water, and add to the protection afforded, so that vessels of larger size will be able to enter it at all times and find a safe refuge. It is to be hoped that a good landing quay will be formed.

The port is well worth a visit for the sake of the view to be obtained of the surrounding hills and mountains, but for no other reason. The ground around the port has a desolate and neglected appearance, is nearly without trees or verdure, seats, or anything to render the spot pleasant and attractive. With a little care and outlay all this might be altered, and the port made one of the bright and agreeable features of the town, to which both visitors and townspeople would be glad to repair, to enjoy the beautiful prospect thence obtained.

The cemetery, or 'Campo Santo,' as already stated, is situated on the west side of the town, nearly opposite the Hôtel des Anglais. There is from it a fine view of the mountains, but none of the sea. It consists of a chapel in a square piece of ground, enclosed in high walls, inside which is a covered way with supporting pillars, and under this are many of the principal vaults, monuments, and tombstones, mostly in marble; thus situated, they, as well as the flowers and decorations, are well protected from the weather. The central portion of the cemetery is planted with rows of Cypress trees. At the head of many of the tombstones, photographs of the deceased are placed—a curious custom, but which has much to recommend it.

When I first visited the cemetery at the end of November, many of the graves were decorated with fresh flowers, one especially attracting attention. Upon this lay a beautiful cross about eight feet long, formed mainly of hundreds of freshly-gathered 'Gloire de Dijon' roses intermixed with other kinds of roses, all of which blossom in the open air in great profusion throughout the winter. A portion of the cemetery has been set apart for Protestants; in this are many graves of Germans and English, the number of the former predominating; indeed, the English who are buried here are comparatively few.

The Sunday after All Saints' day, in France the *jour des Morts*, a procession is formed to the cemetery, accompanied by great numbers of the townspeople, especially those who have relatives or friends buried there. A service 'in memoriam' takes place, and the people deposit in great profusion wreaths, immortelles, and flowers on the graves; they also sometimes suspend on the head-stones small coloured lamps.

Having brought the description of San Remo to a conclusion, the Sanitary condition of the town may next be considered, and *especially the* Water Supply and Drainage.

On the importance of a Pure Water Supply it is unnecessary to insist. To be satisfactory, it should fulfil the following conditions: the water should be pure, abundant, easily accessible to the inhabitants, and should not be liable to contamination, as by the proximity of drains and cesspits. San Remo itself is supplied by about eight fountains, situated in different parts of the town. The water supplying five of these is obtained from Lago Negro, below San Romolo and near San Michele; it is conveyed to the town by an aqueduct, which runs beside the San Romolo road at an elevation which renders its subsequent distribution a very simple and easy proceeding. For this supply the town is indebted to the late Dr. Andrea Carli, who, according to Dr. Onetti, 'always occupied with the welfare of those under his administration, and they having had only the impure and muddy water of wells or cisterns to drink, a source of endemic maladies, typhoid fevers, gastro-enteric disorders, and of verminous affections, procured for his native place in 1828 wholesome and potable water, distributed by five handsome fountains erected in as many spacious public squares.'

I have had the water of the fountain in the market-place, which is supplied from Lago Negro, analysed by Mr. Otto Hehner, F.C.S., with the following results:—

	In 100,000 parts
Chlorine	1·35
Sulphuric acid	0·728
Nitric acid	0·124
Free ammonia	0·0008
Albuminoid ammonia	0·0007
Total solids	24·0
Hardness	20·0

The above figures prove that this water which, however, becomes turbid after heavy rainfall, is of considerable purity, as was to be anticipated from the source from which it is derived, and of a moderate degree of hardness. The first and most important condition of a good water supply, namely, purity, so far as the fountains supplied from Lago Negro are concerned, is therefore fulfilled.

Now I have noticed that these fountains are always running; the supply hence is constant and abundant, and thus the second condition, so far as relates to them, is also complied with.

The water, however, is not laid on to the houses, but the people have to obtain it from one or other of the fountains, and at the cost of time and great labour have to convey it, sometimes up steep streets and staircases, to their dwellings, storing the water thus obtained too often in any pails, pans, or utensils which may be procurable, whereby it frequently becomes more or less contaminated.

But the remarks just made have reference only to the supply of the town from these fountains. The houses, villas, pensions, and hotels obtain their supply from wells, one well in some cases being common to two or more houses. Now the quality of the water in these cases may be expected to vary a good deal, according to the situation and depth of the well. With a view to test this, I made some time since a selection of the water from three wells; 1, from near the Villas Carli, and consequently not far removed from the sea; 2, high up on the west side; and 3, low down at the east end of the town.

These were also subjected to analysis by Mr. Hehner, with the subjoined results:—

	In 100,000 parts		
	1	2	3
Chlorine	24·30	7·42	21·12
Sulphuric acid	14·283	3·667	5·398
Nitric acid	12·690	0·137	2·498
Free ammonia	0·0045	0·0106	0 0158
Albuminoid ammonia	0·0056	0·0032	0·0046
Total solids	146·6	63·1	103·8
Hardness	63·6	37·2	38·0

The above results prove that the water No. 1 was so impure that it could not be used with safety: it contains large quantities of chlorine, sulphuric and nitric acids, and it is exceedingly hard; it is unsuited alike for drinking, cooking, and washing. Several houses used to be supplied from this well, the use of which has since been discontinued. No. 2, although very far from being so bad as No. 1, is by no means a good water, and it is much harder than is desirable for all the purposes of domestic use. No. 3 must be pronounced a very bad water, much worse than No. 2, but not so impure as No. 1.

Thus, of the four waters submitted to analysis, one only is of the requisite purity, and this is not as soft as could be wished. Even if the three waters to which exception has been taken had been above the suspicion of contamination, they are yet much too hard, their hardness rendering them objectionable for drinking, cooking, and washing: for drinking, because, being less readily absorbed, they impede digestion; for cooking, since they are less efficient solvents and extractors; lastly, they are unsuitable for washing because they are less cleansing and very wasteful of soap. When used for drinking, hard waters should be previously softened by boiling, and then passed through a filter in order to remove the large quantity of lime which becomes thrown down.

From the fact that good water is to be obtained from the heads of some of the valleys which intersect the surrounding hills, its supply to all the houses would, so far as the engineering *is concerned, be a* comparatively simple affair; such a scheme

would, however, cost a considerable sum of money, but there would be the water-rates to meet the interest of the outlay, and as a rule there are few more remunerative investments than in water companies. The present system of supply is a very costly one to householders, by reason of the labour involved, which frequently necessitates the payment of people specially engaged to bring from the well the water daily required.

The Municipality of San Remo are now fully alive to the necessity which exists for obtaining a constant and abundant supply of pure and soft water; this being urgently required both for domestic use and for irrigation. Already, after much and prolonged discussion, the terms and conditions of a contract have been agreed upon between the Municipality and the Société Foncière Lyonnaise. The Society propose to bring the water from the Sorgenti d'Argallo, situated in the mountains above Taggia; these springs help to form the river, which, flowing past Taggia, reaches the sea at the village of Riva.

The concession obtained by the Society has been transferred since the above paragraph was written to Messrs. Marsaglia, who were the contractors for the St. Gothard tunnel, and they are under conditions to complete the supply within two years.

The Syndic, Signor B. Asquasciati, has taken an active interest in this question, and is to be congratulated on the result of his efforts.

The rain which falls on the roofs of the houses in the old town is discharged at once into the streets by means of overhanging spouts: any one, therefore, passing through the streets, stands an excellent chance of being well drenched by the descending columns of water and by the splashings. Now, considering the scarcity of water and the labour with which it is obtained, it might be supposed that the people would be careful to collect as much of the rain-water falling from these spouts as possible; so far, however, is this from being the case, that I have rarely seen a tub or vessel of any description put out to catch this soft and valuable rain-water.

In the case of some of the newer villas, special tanks have been constructed for the storage of rain-water. Some of these supply water for domestic use, and others for watering gardens or irrigating land.

Next in importance to the water supply of a town is the Drainage and other means for the removal of the Daily Refuse.

In our visits to the old town we have been agreeably surprised at the general cleanliness of the streets, and comparative freedom from bad smells; the same remark applies to the principal streets of the newer portions of the town.

In passing *through* the old town, numerous gratings are

observed which communicate with drains intended only for the reception of the liquid refuse of the houses, although solid organic matters often find their way into them, as shown by their being infested with rats.

In the chief streets of the lower town, similar gratings and drains exist, the latter terminating usually in the sea. These drains, like those of the upper town, are not for solid sewage; notwithstanding which, however, in the course of time a considerable precipitation and accumulation of organic matter takes place in them, giving rise in certain localities, from the decomposition which ensues, especially in hot weather, to offensive and noxious emanations.

It does not appear that any means exist for flushing the drains, nor—judging by the fact that bad smells may sometimes be observed coming from the same grating for a long time together—that steps are very frequently taken to remove accumulations and obstructions. The heavy rains of the autumn and spring do much to cleanse and purify the drains and so to lessen the smells, which it is to be feared in the summer must be greatly intensified, not only from the diminished rainfall, but from the greater rapidity of decomposition at that season of the year. It is very desirable that the drains should be periodically flushed, freely ventilated, and numerous outlets afforded for noxious gases, by means of 'safety' pipes in suitable situations, carried up the sides of houses.

It is stated that there are few or no cesspits in the old town, so that the solid house refuse has to be got rid of by other means: what these are will presently appear. For the various hotels, pensions, and villas, there is no regular system of drainage at present, but only cesspits. Part of the drainage from some of the hotels makes its way into the sea, giving rise sometimes to offensive and possibly injurious smells; while the refuse from some houses is thrown into certain gullies or ditches from which, as a consequence, especially in warm weather, and at night, unsavoury odours not unfrequently proceed. Care should be taken that the cesspits are emptied at proper intervals and periods of the year, and that the wells should not be in such a situation as to allow the possibility of the contamination of the water through the intervening soil. With a view to obviate this danger the cesspit should be cemented, and placed considerably below the well, and it should also be provided with a ventilating tube or shaft. In many cases these precautions have been adopted.

The general cleansing of the town, and the collection of such of the refuse as is thrown into the streets, is performed by women. They daily sweep up this refuse, which is afterwards removed and employed as manure, chiefly for the Olive trees, for which it is

much prized. In very few cases is the house refuse collected in baskets, or other convenient receptacles, and placed in the street with a view to its removal; and strange to say, no public provision whatever appears to have been made for the removal of house refuse generally, and particularly of that from the private houses and villas. Each occupant does as he thinks fit with this, and gets rid of it the best way he can, usually by throwing it into the nearest torrent, or taking it down to the shore and casting it into the sea, thus giving rise to unsightly spectacles, bad smells, and also wasting a very large quantity of valuable fertilising material.

One would have supposed that this would be eagerly sought after, and that its value would more than pay the cost of its collection. There ought to be, as there is in so many other towns, a regulation rendering it imperative on the inhabitants to put their house refuse in some suitable receptacle in an accessible place, with a view to its daily removal early in the morning. In this way many tons of good manure would be obtained each week, and the town, torrents, and sea-shore kept clean and sweet. Not only is the refuse disposed of too frequently in the manner above described, but even in more objectionable ways, as by casting it over walls and throwing it in all sorts of bye-places and corners, where it becomes obnoxious alike to sight and smell.

[Four years have elapsed since the preceding remarks were penned, and no system for the collection of the house refuse has yet been adopted or seems likely to be. The cleansing and scavengering of the streets and roadways are better performed than formerly, and consequently there is less to offend the senses. In the absence of any public provision for the removal of house refuse, householders are enjoined to dig a hole in the garden, if they have any, and to throw the refuse into this; but many people have no gardens, and if they had the hole or pit soon becomes filled, and still sooner the mass within it becomes corrupt. In such cases the only alternatives are either to earth over the putrefying mass and to dig another hole in the garden, or to cart the refuse away from time to time. The former proceeding is often impracticable, and the latter is so costly and inconvenient that it is pretty sure to be neglected.]

Thus, while the main streets of San Remo are kept clean, and are tolerably free from smells, the same cannot always be said of the less frequented streets and outlying places, including the neighbourhood of the port, the arches under the railway, and many other localities, where one is often confronted with accumulations of nastiness which ought not to be permitted to exist for a day even in the poorest town. The principal reason for this state of things is that the working and poorer population are un-

provided in their dwellings with the usual accommodation. Even the few conveniences in the town are so constructed and arranged as to give rise in hot weather to nauseous smells, while they are placed in such public situations that they are a perpetual offence to passers-by. The condition of things described is the more to be regretted, since it might easily be remedied, and at a very small cost.

A few remarks may now be made respecting the inhabitants of San Remo.

The San Remese possess the good looks so characteristic of Italians, the regular features, large dark eyes, thick luxuriant black hair, and the expression in a marked degree of high intelligence. Their complexions are for the most part bad, being generally dark, swarthy, and sallow, the sallowness denoting the lymphatic temperament, and being due in some cases to ill-ventilated and dark habitations as in the old town, and to the poorness of the food. The effect of these influences is particularly observable in children and young people.

The men, though well-grown for the most part, want that robustness of form and development of muscle which denote strength, and distinguish the hardier northern race. The women, while young, are bright-looking and comely, but they soon lose their youthful looks, and at an early age become faded and wrinkled. This premature change is partly to be explained by the nature of the occupations which fall to the lot of very many of the women of the working classes in this part of Italy. Unlike what prevails in most other countries, here the women do the rougher, heavier, and the most repulsive part of the work; thus, they assist in building the houses, ascending even to the roofs, and carrying on their heads loads of mortar, bricks, and stones. They are frequently seen carrying baskets of sand and shingle up from the seashore, and in this laborious occupation even girls of tender age are employed at a period when all their powers are required for the development and strengthening of their frames. The women sweep up the streets, and carry on their heads to the Olive plantations the baskets of evil-smelling refuse thus collected; in the same manner they carry heavy casks of wine (Fig. 5), tubs of water, sacks of flour (Fig. 6), sofas, and wardrobes. If a piano be hired it is sent home on the heads of three or four women, a man frequently walking beside them like a corporal in charge of his file; indeed, the men as a rule think it derogatory to their dignity to carry such burdens. One cannot but feel for the women on meeting them thus heavily weighted, really more like beasts of burden than human beings. Sometimes, however, and at certain seasons, the loads which they bear on their heads, as baskets of olives, which they bring down daily

from the groves to the olive mills to be crushed, or oranges and lemons, are of a pleasanter and more suitable character.

The dexterity which the women display in carrying heavy loads, balancing them on their heads, is really remarkable, and is no doubt explained by their early training, since they commence as mere children. I have seen women carrying large shallow tubs of water up the steep streets of the old town, without once touching the tubs with their hands or spilling a drop of the water.

Fig. 5.

These occupations, so far from giving the women grace and freedom of carriage, as some writers have imagined, cause them to lose their complexion and youthful appearance, and render their figures coarse and unshapely.

But the most curious part of the matter is that the women themselves see no hardship or impropriety in all this, but prefer labour so unsuited to their strength and sex, to domestic service. So much is this the case, that it is very difficult to obtain an un-

married woman-servant, and if one be secured she is nearly sure to be ignorant of the duties required of her, added to which, as a rule, she can neither read nor write. It is only recently that married women have become willing to go into service, but the high rate of wages now given, and their own poverty, have to some extent overcome the disinclination.

In consequence of the inefficiency and small choice of Italian servants, many of the visitors to San Remo, both English and German, either bring with them their own or engage Swiss, French, or German servants, who, while they are more efficient, are also obtained at much lower wages. An Italian woman-servant, however incapable, expects to be paid at the rate of from 50 to 60 francs a month.

The necessity for engaging foreign servants is very much to be regretted, as the San Remese women thus lose much money every season. It is most desirable that the Italian ladies should set on foot an institution for the training of young women in the duties of domestic service.

The conveyance of heavy goods from village to village is mostly effected on the backs of donkeys; this arises from the steepness of many of the mountain ascents and the absence of roads. The burdens laid on these patient and most useful animals are not a little varied and curious; now casks of wine, one slung on either side (Fig. 7), now panniers, filled with sand and stone, or faggots of firewood; bundles of bamboos trailing many feet behind the donkey, and presenting a most singular appearance, or brushwood intended for the oven, consisting mainly of Fir, Juniper, Lentiscus, and Myrtle.

The way in which the washing of clothes is performed at San Remo differs but little from that practised in most parts of Italy, France, and Germany. Wherever there is water, no matter how scanty or dirty it may be, there you are sure to see women washing. It is in the shallow streams in the neighbourhood of San Remo that most of the washing is carried on, and the water of these is more or less polluted by the filth and refuse of all descriptions constantly thrown into them. The clothes are brought down to these streams in baskets, several women washing near together; each selects a suitable stone, and on this she rubs and soaps the clothes. There is little rubbing between the hands, and no use of hot water as with us, and much of the soap is of course wasted in the stream without its having exerted any action at all in cleansing the clothes. The consequence is that in many cases the linen is very imperfectly washed, and is much injured by the rough usage to which it is subjected.

Although the Italian and French washerwomen do not make *use of large quantities* of soda like the English with a view to

soften the water and so to save soap, they sometimes have recourse to a proceeding of very similar character, and which produces a like effect. As the fires in the South of France and in Italy are all of wood, a large quantity of a greyish-white ash is produced; this, of course, contains much alkali, as the washerwomen have found out by experience, and hence it is a common practice to sprinkle wood ashes over the clothes after they have undergone the first cleansing with soap.

FIG.6.

After having been washed in the rude and primitive manner described, instead of the clothes being hung on lines supported by props as in England, the clothes are frequently spread out on the ground, on stones, walls, or palings, and in fact anywhere where space is to be found, quite regardless of appearances. This proceeding does not make the clothes any cleaner. In the poorer quarters of Italian towns the houses are perfectly disfigured by the display of somewhat unsightly garments hung out to dry. The practice of hanging the clothes in every available place is a real

disfigurement to the town, and it is a pity that no proper drying-grounds have been provided.

But the great objection to the practice of washing clothes in the manner described, is the liability to their becoming infected, either by the sewage thrown into the streams, or by infectious matter contained in contaminated garments.

It would be a great boon if the authorities were to erect two or three large public washing-places in suitable situations, protected from the weather, and provided with a good supply of pure soft water. For the use of these a small charge might be made, which would be covered many times over by the saving of soap alone, to say nothing of the saving of labour and avoidance of illness. It is very certain that washing as the poor women do now, exposed to all weathers, and kneeling in cramped positions in damp places or on the hard stones, they must often suffer greatly in health.

At the north-east corner of the market there is already one such washing-place, the 'Lavatoio Pubblico,' on a very small scale, but this is wholly inadequate to the requirements of so populous a town.

On Sundays, holidays, and during the long evenings of spring and summer, the San Remese are very fond of walking in the Corso Garibaldi or on the Promenade de l'Impératrice, assembling often in considerable numbers. It is very interesting to observe them when thus gathered together. The appearance and dress of the women are peculiar; they are usually without bonnets, caps, or other covering to their heads than their abundant black hair, and each wears a gaily coloured handkerchief folded like a shawl and crossed over the chest; but if the weather be very cold they sometimes tie a handkerchief over their heads as well.

The characteristic and graceful black lace veil is occasionally seen, but the wearing of bonnets or hats is confined entirely to the upper classes. The men wrap themselves up much more carefully than the women, and they are commonly seen wearing grey woollen shawls exactly like those usually worn by women; others wear cloaks of ample dimensions, with one side thrown over the shoulder as in Spain. Whatever the style of dress adopted, the men are all very warmly clad, and even in weather by no means cold, most of them carry a shawl or other wrap over the arm, to be put on at sunset or in the event of any sudden change of temperature. Further, many of the men of the peasant class carry large umbrellas of the brightest colours. Mingled with the crowd are many priests and a few Capucin monks, who by their dress give character and picturesqueness to the scene. Until recently San Remo contained, besides its numerous churches,

several conventual establishments; most of the latter no longer exist, but a great many priests and ecclesiastics still find occupation and have their homes in San Remo.

The opportunities for exercise in and around San Remo are considerable. The inducements for walking exercise, which may

Fig. 7

be taken almost daily in the winter, are very great, owing to the beauty of the country and the variety of walks and excursions in the neighbourhood, as, going westward, to Capo Nero, Ospedaletti, and Bordighera, and eastward, to Poggio, Capo Verde, and Taggia; also up the several valleys, and over the hills and mountains. For those who are not strong, there are many walks

near the town in the Olive groves, some of which are within the reach of invalids, while for the longer and more distant excursions there are plenty of donkeys to be hired at a very reasonable rate, but the principal excursions in the neighbourhood of San Remo will be found described elsewhere.

The number of drives has been considerably increased of late. The principal are, westward along the far-famed Corniche road to Ospedaletti, where a new town is being rapidly formed, to Bordighera, to Dolceacqua up the valley of the Nervia, Ventimiglia, Mentone, and Monaco; and eastward, to Poggio, Capo Verde, and Ceriana, to Taggia, Riva, San Stefano, Porto Maurizio, and Oneglia. A carriage road has recently been constructed, which, starting from the Genoa road a little to the west of Capo Nero, leads to the top of the cape and to Colla, the views from near which are as beautiful as those on the east from the Madonna della Guardia on Capo Verde. Several other roads have either recently been made or are in course of construction. One of these is the Strada Berigo, which commences at the Giardino Pubblico, skirts this, and passing through an angle of the old town, continues up the San Romolo valley for some distance; it then winds to the left till the Piazzo San Bernardo is reached, a very fine view of the old town being obtained on the way. The road then runs on the level for nearly a mile high above the sea, and many of the villas and hotels, descending at length into the Foce valley, which it follows till the high road is reached near the bridge, which crosses the Foce torrent.

Near the centre of the Berigo road and close to the Villa Diano another road has recently been constructed by the Société Foncière Lyonnaise, which ascending northwards opens up the extensive property lately acquired by the Society. Some very fine views are obtained from this road, which however is not yet finished.

The other new roads are on the east side of the town; one, the Via Francia, commences at the Church of the Angels, and after running in a straight line for a time divides into two.

One branch follows the course of the San Francia valley for a considerable distance, crosses the valley by a new and handsome stone bridge, turns abruptly to the left, and then, traversing the west side of the valley, gradually ascends until it passes beneath the Madonna della Costa. From this point it is intended that the road should cross the San Romolo valley and join the eastern end of the Berigo road. This will be a great improvement, as it will establish the much desired communication between the new roads on either side of the town.

It is intended also that hereafter the road should be carried from the Madonna della Costa along the ridge as far as San Romolo.

This place will doubtless then become the summer health resort of San Remo for those invalids who after a winter season here are recommended to remain abroad in a suitable locality.

The other branch of the Via Francia turns abruptly to the right, running behind the Hôtels de Nice and d'Angleterre, and terminating at the Rondo.

A third new road, the Strada Peirogallo, starts from the Rondo, follows the west side of the Bestagna Valley, crosses the torrent, and turning sharply round ascends the eastern side of the valley, passing at the back of the Villas d'Anvers and Zirio, until the Villa Brigida is reached; here it turns to the right, and after a steep descent reaches the main road nearly opposite the Hôtel Meditérranée. This also is a very pretty road, and opens up some eligible building sites.

Another road which has been in course of construction for some time is the Strada Verezzo: this is approached from the east end of the Strada Peirogallo; from which it commences at the Villa Brigida. This will be continued to the village of Verezzo, a distance of some three or four miles, and will form another very attractive drive.

There is still another new road which should be mentioned, though it is at some distance from the town; this runs from the Genoa road along the east side of the Ceriana Valley, and extends to the village of Bussana, with Poggio on the opposite side of the valley; these places will be specially referred to later on.

Although the whole of the places and excursions which have been named are within the compass of a drive, yet the distant ones may be still more quickly reached by railway; indeed, very pleasant excursions may be made to any of the places on the railway as far as and even beyond Nice, returning to San Remo the same day.

The pleasure derived from the walks may be greatly enhanced if there be added the pursuit of some branch of natural science, as geology, botany, or entomology, and for which rich and rare materials everywhere abound.

Then, from the little harbour, in suitable weather, boats may be taken for a row or sail along the ever beautiful shore of the Mediterranean; the most complete view of San Remo, as already stated, being obtained at a little distance from the town.

Although fishing is to be had at San Remo there are more facilities for this pursuit at Bordighera, which may be reached by train in twenty minutes.

In the early spring bathing may be freely indulged in by those in health, and without the risk of accident.

Among the amusements the Theatre may be mentioned, with

its operatic representations, as well as the excellent Municipal Band which plays in the Public Garden several times a week throughout the winter.

There are two libraries, those of Gandolfo and Berio, where the works of a great number of English and foreign authors may be obtained; the subscription is moderate.

In the season there are a few balls and dances, the majority of which are held at the different hotels, although here, as at most resorts for invalids, the chief social meetings take place in the afternoon. In the spring many picnics are organised, and these are really very enjoyable, the most beautiful spots of the surrounding country then being visited.

If the list of amusements at San Remo be not long or striking, it must be remembered that this place is chiefly a health resort, and that the pursuit of health and such night pleasures as are afforded by operas, plays, balls, and dances cannot often be successfully combined. Still, there are few towns of the size of San Remo which possess so excellent a band and so well appointed a Theatre, or rather, Opera-house, since it is devoted almost entirely to the performance of operas.

Amongst the amusements at San Remo during the winter season, the Carnival must not be forgotten; but here, as elsewhere in Italy, it seems each year to become less interesting and amusing. The only really pleasant day of the Carnival is that devoted to the throwing of flowers, *le Jour des Fleurs*.

CHAPTER II.

Food Supplies at San Remo—Mediterranean Fish—Sale of Small Birds—Vegetables—Fungi—Fruit—Many Articles partaken of in France and Italy, not used as Food in England—Indiscriminate Slaughter of Small Birds.

A FEW years since, before San Remo became an important health resort, and when the town was inhabited almost entirely by the native population, whose mode of living is so much simpler than our own, the food supplies were indifferent in quality and presented but little variety, the surrounding mountains and valleys not yielding very much in the way of food, beyond mutton, poultry, olive oil, fruit, and vegetables. Now, however, since the arrival of so many strangers, especially English, the supplies have gradually increased in quantity and variety, and the cost of living also in nearly an equal ratio.

The oxen which furnish the beef are brought mainly from Piedmont, and instead of being driven here as formerly, the condition of the cattle being thereby greatly impaired, they now arrive for the most part by rail, Mentone, Nice, and Cannes being supplied from the same source. The quality of the meat furnished by these oxen is excellent, but some of the beef sold in San Remo is inferior. The sheep come from the surrounding mountains, and there being, especially in the winter, but little pasturage, they are thin and the mutton usually not equal to that we are accustomed to in England. Lamb is eaten far too young, some of the lambs being but little larger than hares. Veal is good, but not so white as in England, it sometimes being more like beef in colour.

The supply of Poultry is abundant, and includes not only fowls, but turkeys, guinea fowls, ducks, and geese; the quality is for the most part good, and the prices moderate. There is also usually plenty of game, especially hares, partridges, including both the red and grey legged, wildfowl, woodcock and snipe, but pheasants are rather scarce and are seen in the market chiefly at Christmas.

Flour and Bread are both good, but dear. The native population usually make their own bread. Most of the Butter

sold is good; much of it comes from Milan. The Milk is also good but not rich. As there is no pasturage in or near San Remo, especially in the summer, the cows are kept in the mountains until the commencement of the winter, when they are brought down and are then stall-fed.

With respect to Fish, the supply is more limited. The fish of the Northern seas is now, however, brought regularly to Nice, and from thence is distributed to the different health resorts of the Riviera. This fish of course arrives packed in ice, and hence its quality and flavour are somewhat impaired.

The quantity of fish caught in the Mediterranean is not considerable; the fish are usually small, and but few are of really first-rate quality, though some are very good. Several reasons are assigned for the paucity of fish in the Mediterranean; one of these is its exceptional warmth. It is a curious fact that all the more valuable kinds of fish are found in the greatest abundance in the colder seas, as those of North America and the North of Europe; it is from the latter that the shoals of fish caught on our English shores annually migrate. The fish of tropical climates is neither abundant nor very good. Other reasons are the great depth of the water, reaching to nearly 10,000 feet in some parts, and the absence of shoals. In deep water there is a comparative scarcity of animal life, and a consequent diminution in the amount of food available for the nourishment of fish, while the absence of shoals operates by rendering the deposition of the spawn and breeding of the fish more difficult.

But there is still another very singular reason assigned by Dr. Carpenter for the comparative absence of fish in the Mediterranean, and that is, the small amount of oxygen contained in the water of that sea as compared with the Atlantic; it being only 5 per cent. in the former and as much as 20 per cent. in the latter: now, oxygen is the great supporter of respiration and of animal life. This deficiency is attributed by Dr. Carpenter to the oxygen combining with the organic matter contained in large amounts in the small rivers and torrents which discharge themselves into the Mediterranean. At the same time that there is a diminution in the oxygen, there is an increase in the carbonic acid.

At San Remo there is not much fishing, part of the fish consumed being obtained from Bordighera, but fishing is also carried on to some extent at Mentone, Cannes, and most other towns on the coast. The method usually pursued is as follows. Owing to the depth of the water trawling is, of course, out of the question: in lieu of the trawl, exceedingly long straight nets of some 6 or 7 feet in depth, properly weighted, are employed; these are thrown into the sea at a short distance from the shore,

the two ends are dragged along by men in boats, and gradually approximated; thus any fish which may be contained in the space enclosed by the net are captured. The operation of casting the net and hauling it on to the shore is one which occupies a good deal of time and is attended with some excitement on the part of those, usually some ten or a dozen men and boys, engaged in it, and much interest and curiosity are evinced by the bystanders. After much shouting and hauling at the long ropes attached to it, the net with its contents is landed on the shore, and every one rushes forward, including the fishermen themselves, to inspect the capture. After so much time and labour expended, and so many persons being employed, one naturally expects some adequate result, but, as a rule, not more than two or three dozen small and insignificant-looking fish are obtained, scarcely enough to fill even a very small basket, and one wonders how such captures can possibly pay the number of persons engaged.

In some cases the net is carried out far to sea and is drawn along for some miles between two sailing vessels which, when it is not too rough, are able to keep an exactly similar course; this mode of fishing is much more effective. The vessels are not permitted to approach too near the shore on account of the destruction of the fish spawn which would ensue.

In the spring the tunny is frequently caught along the North shore of the Mediterranean. This fish attains a length of some six feet; 'its taste is excellent when fresh; it is well known in France and England preserved in oil.' (Marcet.) It is caught in nets spread horizontally, the fish being thus enclosed, and when captured they are at once killed. The chase and capture of the tunny are particularly exciting.

Along the shores of the Riviera fish are sometimes caught at night by spearing. 'It frequently happens,' writes Dr. Marcet, 'that one or more bright red lights are seen in the water, moving slowly along the shore, and rising and falling under that invisible undulation seldom absent from the Mediterranean Sea even in the calmest nights; or perhaps while sitting in one's drawing-room in a villa or hotel near the sea, a sudden glare through the shutters will reveal a most unexpected and novel sight. What indeed can be that very bright light? The shutters are thrown open, and then a small boat may be seen in a flood of red light manned by two or three men with faces crimson coloured from the glare of a bright fire of coal and bituminous pine wood. A grate or metal basket is fixed to the stern of the boat and overhangs the sea; it is one mass of light, the flames of the ignited wood rising high above the occupants of the skiff. Presently one of its men thrusts the end of a stick into the burning mass; he uses it as a poker, and then follows a shower of glittering sparks.

The fishermen may now be seen intent on their pursuit; each of them holds the handle of a long spear in the right hand, looking eagerly over the bows of the boat and apparently in the act of striking; the picture, with its wonderful contrasts of light and shade, is worthy a Rembrandt. Suddenly the hand is brought down vigorously with a sudden stoop of the body, again it is withdrawn, and in the light of the brazier a fish is seen glittering and struggling on the prongs of the merciless weapon; another second the fish wriggles in the boat, while the fisherman prepares to strike again.'

Although the Mediterranean does not yield any great abundance of fish, yet there are many kinds partaken of, and a few of these, though small, are really excellent. Thus the sardine, Clupea pilchardus, is both abundant and cheap, and when properly fried in good olive oil it is exceedingly nice and to be regarded in fact as a delicacy. Sardines are sometimes sold about the size of whitebait, and these are quite equal to their renowned English namesake. Not unfrequently large baskets filled with a gelatinous-looking substance are seen in the market; this, when closely examined, is found to consist of the fry of a fish which Dr. Günther believes to be the sardine; so small is it that it is necessary to cook it in batter. It is a thousand pities that this wholesale destruction of the fry of so commercially important a fish as the sardine, especially on the shores of the Mediterranean, is not strictly prohibited. The fresh anchovy is also not unfrequently seen in the market. Other kinds of fish which are really very good, are a species of whiting said to be of excellent flavour, the red mullet, called Rougie, Mullus barbatus, as well as some other kinds; a broad flat fish distinguished by its pinky hue, Pagellus erythrinus; another, characterised by four yellow stripes or lines running along the body, known as the Dorade, is Mæna vulgaris; there are also the Amande, Box salpa, and the Loup. But a great variety of other fish are partaken of, although not equal in quality to those already mentioned, as Serranus scriba, S. cabrilla, species of perch; Sargus annularis and S. vulgaris; Cantharus lineatus; Heliastus chromis; Crenilabrus rostratus; Scomber pneumatophorus, a species of mackerel; Cepola rubescens, a ribbon-like fish; and lastly, the beautiful and many-coloured Coris julis, characterised by a broad vermilion stripe down each side. For the scientific names of these fish I am indebted to the kindness of Dr. Günther, of the British Museum.

These fish, and especially the sardine, should be partaken of with a plentiful sprinkling of the juice of a freshly-gathered lemon; they are all greatly improved by this addition, which is far more pleasant and wholesome than the hot and pungent *sauces so generally* used in England.

Occasionally, in the spring of the year, the fish of the Northern seas are caught in the Mediterranean, having been carried into it by the Gulf Stream through the Straits of Gibraltar. In the season, salmon and trout are found in the shops of San Remo. Among the more curious and scientifically interesting fish sometimes captured, is the electric torpedo. If an early visit be paid to the market a variety of curious Mediterranean fish, in addition to those already mentioned, are often seen; Cuttlefish are caught in large quantities all along the Riviera. Their mode of capture is peculiar. The boat is gently rowed over the rocks near the shore, the fisherman being armed with a long stick baited at the end; this he puts down amongst the rocks wherever he thinks the fish would be concealed; these clutch at the bait thus presented to them, and, tenaciously adhering to it, are readily drawn to the surface of the water. There are at least two species of cuttlefish caught in this manner, and they are extensively partaken of as articles of food. It enters into the composition of that favourite dish Bouillabaisse.

A species of so-called Sea Hedgehog, or Urchin, Echinus esculentus, is met with on the rocks close to the shore in vast quantities; basketsful of them are sometimes seen in the market, but they are mostly sought after and eaten by the poor. The shell is at once broken, and a small bright red mass is extracted and eaten quite raw. They are often detached from the rocks and fished up from the water by means of long cleft bamboos, the prongs of which are made to grasp them.

Oysters at San Remo are neither very plentiful nor very good. At Cannes and Nice they are abundant and of excellent quality; they are of several different kinds, the most curious being the green oysters, Marennes or Huîtres Vertes; it was formerly supposed that this colour indicated the presence of copper, then that it was due to à green fungus or alga, but it has recently been determined by M. Puysegär,[1] that it arises from a species of diatom, Navicula ostrearia. The oysters feed on this green colouring matter which, becoming dissolved during digestion and entering the blood, imparts to them the characteristic green hue. It does not appear that these oysters are at all unwholesome, although their stomachs are filled with the siliceous shells of the naviculæ.

Not unfrequently baskets of Snails of two different kinds are seen here in the market, as in France.

Thrushes, Blackbirds, Starlings, Larks, Goldfinches, Chaffinches, and even Robins, in fact all the smaller members of the feathered tribe, are generally to be met with in the market in

[1] Sur la cause du Verdissement des Huîtres.

large numbers, no matter how rare the bird, how beautiful its plumage, or how sweet its song.

The Vegetables in the market include all the usual kinds, according to the season, as well as one or two which are not so generally met with, as Salsafy, the leaves and roots of Chicory, and Cardon. Salsafy, Tragopogon porrifolius, belongs to the same natural order as Chicory; the roots, when cooked, are soft and tender, but possess little flavour. The leaves of Chicory, Cichorium intybus, are either used alone as salad or mixed with lettuce or some other suitable vegetable; and the roots are boiled like those of Salsafy, and served with sauce; but, notwithstanding the boiling, the roots are somewhat bitter and woody. Neither of these vegetables can be compared for a moment, either in texture or flavour, with carrots or parsnips.

Cardon consists of the stems and leaves of a species of thistle or artichoke, Cynara cardunculus, grown so as to bleach the leaves in the same manner as celery, to which the heads of cardon in form and appearance bear a striking resemblance. When cooked like celery it furnishes a very palatable dish, the leaves being tender and the root having somewhat the flavour of the artichoke.

In the autumn and early winter large baskets of Fungi are exposed for sale and appear to be in much demand; there are several species partaken of, all differing from the mushroom commonly consumed in England. One kind is of a salmon colour, and is named Lactarius deliciosus; another, with a black epidermis to the shield, is Boletus edulis, and this is the one most frequently met with in the market, being sometimes sold in the dried state; a third, characterised by the vermilion colour of the epidermis, is Agaricus Cesareus; a fourth, Agaricus albellus, is much esteemed on account of its perfume; but the only kind which appears in the winter is Agaricus campestris L., commonly called Boleto d'Ulivo.

Tomatoes are particularly abundant and cheap; they are full of flavour, and constitute a most agreeable addition to many dishes; they should be partaken of freely, like other vegetables, and not used merely for flavouring. So abundant are tomatoes here that large quantities are made into a 'conserve de pommes d'amour;' this consists of the pulp of the tomato deprived of its seeds, with salt, pepper, and other flavouring added. In this state it keeps for a considerable time, and acquires a dark, ferruginous, red colour which gives it a very singular appearance. Tubs and pans filled with this conserve are to be seen very frequently in the early part of the winter, it being evidently in much demand by the San Remese. Tomatoes also make an excellent jam when *boiled with sugar* and very slightly flavoured with lemon juice.

The Red Aubergine is frequently seen in the market, and is often served up at table, especially when filled with some savoury meat stuffing. The White Aubergine, or egg plant, is also grown here, and it may be cooked and served up in the same way as the red variety. Tomatoes are also sometimes stuffed in the same way (tomates farcies), and are nicer than the Aubergine. French beans are to be had in the market up to Christmas, and peas make their appearance about March. In November and December large baskets of beans, resembling scarlet runners, are always to be seen; these look old, and the seeds contained in them are of considerable size, but when cooked they are found to be quite tender and of good flavour; they are known in the market by the appropriate name of 'mange-tout,' and they are certainly very much more nutritious than young French beans.

The Fruits to be had in November include Grapes of different kinds, one a large, oblong purple kind called Croirora, which is really very fine, as well as abundant and cheap; Lemons, not yet very ripe, and a few Oranges. As the winter progresses the number of baskets of oranges and lemons increase, as also does the ripeness and beauty of these fruits, so that during most of the winter they form one of the most conspicuous and charming objects in the market. It is not a little curious that such brightly tinted fruits as the lemon and orange should only begin to ripen and acquire their characteristic colours at the commencement of the winter, and that this process of ripening should be continued throughout that season and not completed until its termination; even sunshine does not appear to be necessary to the ripening, as during a period of continuous rain the fruit may be seen to increase daily in depth of colour. The best oranges in the neighbourhood come from Taggia, whence also we have the earliest green peas. Tangerine oranges are largely grown in and around San Remo; they are of excellent quality, and command a remunerative price. Figs are very plentiful, and of several different kinds; they may be divided into summer and autumn figs, the first ripening its fruits in June, and the second in September and October. In the one case the fruit appears before the leaves, in the other after. There are at least three kinds of autumn figs, all luscious and of delicate flavour, very different from the half ripe insipid figs usually met with in England. One kind is of a rich purple colour, another a pale green, curiously starred at the top, showing the rich purple contents; the third kind is also of a pale green colour, and is distinguished by not being starred, and although, of the three varieties alluded to, it is the least attractive in appearance, its flavour is yet superior to the others. Then again, Pomegranates, so cooling, refreshing, and tonic from the quantity

of gallic acid contained in them, are now to be had in abundance.

The Apples in the market are noticeable for their very large size and beautiful appearance. Medlars are plentiful.

The fruit of the Japanese Medlar is seen in great quantities during the months of May and June; it does not undergo the decay of the ordinary medlar, but the fruit, which possesses a cooling and pleasant taste, is partaken of either in its natural state or preserved in sugar.

The fruit of the Service-tree called here Sorbe, Pyrus torminalis, is occasionally met with; it has the size, form, and colour, when not too ripe, of a very small pear, but when fully ripe it changes like the medlar to a deep brown, in which state it is usually eaten; its flavour is particularly pleasant and delicate, and the Sorbe would no doubt be much liked by all who are fond of medlars, to which in some respects it is to be preferred.

Another refreshing fruit is the Cape Gooseberry. This I have as yet seen only in Cannes, where it was pointed out to me by the Chevalier de Colquhoun. It will, however, grow anywhere in the Riviera.

Unfortunately, the time soon arrives when most of these fruits are no longer obtainable. Other kinds are Olives, Arbutus berries, and Spanish chestnuts. Ripe olives are here sometimes used in cooking as well as the unripe or green fruit. Nothing can exceed the beauty of the bright scarlet coloured fruit of the Arbutus, both on the tree and when prettily arranged with leaves as a dish for dessert; it is juicy, cooling, and sweet, but without any special peculiarity of flavour. There are few more beautiful shrubs than an Arbutus tree laden with its fruit, as seen in many parts of the Riviera, and especially in the garden of the Duc de Vallombrosa at Cannes.

Everywhere in San Remo during the winter are baskets of Spanish chestnuts; these in fact form a staple article of food with the natives both poor and rich; they are usually eaten boiled, when they are really very nice—sweet, mealy, highly nutritious, and by no means so indigestible as might be supposed.

Here as in other countries, when winter commences, the 'marchand de marrons,' with his pan of bright burning charcoal, makes his appearance in the streets, the savoury odour of roasted chestnuts perfuming the air, while in the windows of confectioners' shops trays filled with 'marrons glacés,' are temptingly displayed. Sometimes the chestnuts are deprived of their shells and dried; in this state they may be kept for any length of time. Soaked in water they recover their former size and consistence, and are again ready for use.

In the markets of Italy and France many articles are fre-

quently to be seen, and are commonly used as food, which are never consumed in England.

The Italians, like the French, regard nearly everything as fit for human consumption, and it must be admitted that they thus add very considerably to their food supplies. Many people have been accustomed to laugh at the French for eating and liking such things as frogs and snails; but if we examine the matter by the light of common sense, the French certainly deserve much praise for the discrimination and knowledge which they display in making use of sources of food supply rejected without reason by the people of some other countries. It was the French who first taught us the value of horse-flesh, as well as of many other things.

There is a great deal of mere fancy and much more prejudice about what people eat and what they refuse. Nearly every animal substance, and every living thing to be found on the surface of the earth or in the water, is good for food when prepared in a suitable manner. The quality of the articles thus consumed varies no doubt, but they are all sources of nourishment and contain the principles necessary for the sustenance of the body.

Visiting a French fish-market, such as that of Boulogne, one is astonished at the large quantities of uncouth-looking and often coarse fish there displayed, but which yet find ready purchasers. At the Halles Centrales in Paris we see bushels of large snails, white and clean, quite as pleasing to the eye as are the whelks, winkles, and many other shell-fish which are held in good esteem by even the fastidious Briton. In the same markets may be seen numerous bundles of frogs' legs tied together in hundreds, the flesh of which is more delicate than that of the tenderest chicken; indeed, the quantity seen there is often really amazing, and makes one fear that the poor frog has a harder time of it in France than in most other countries, where nearly every part of his wonderfully constituted little frame is in such requisition by the physiologist and the microscopist.

Again, if we visit the shores of the Mediterranean and inspect the fish-market in any of the towns there, as for instance Cannes and San Remo, we frequently see not only large quantities of cuttlefish exposed for sale, but sea-urchins, many different kinds of univalve and bivalve mollusca as well as other curious creatures, all destined for food. Among bivalve mollusca I have noticed the following. A species of Pinna; Mactra stellarum, L.; Venus verrucosa, L.; Tapes decussata, L.; and Scrobicularia piperata, Gmelin; and amongst univalves, Murex trunculus, L.; Murex brandaris, L.; Natica hebræa, Martyn; Natica olla, M. de Serres; and Trochus (Labio) turbonatus, Born. I have never met with one of these species

in the English markets, the kinds principally partaken of in England being the Cockle, Cardium edule; the Mussel, Mytilus edulis; the common Whelk, Buccinum undatum; and the Periwinkle, Littorina littorea.

Lastly, during the winter months, in the market-place of Cannes, hundreds of small birds, frequently fastened on to strings, are exposed for sale, the birds being separately arranged according to the species; such as thrushes, blackbirds, starlings, larks, sparrows, chaffinches, goldfinches, linnets, and a great variety of other birds, including even the little Robin, which with us is almost sacredly preserved. But the sale of small birds is not confined to the market at Cannes: they are to be found in large quantities in all the towns of the Riviera, including San Remo, where the number of thrushes and blackbirds sometimes exposed for sale is really surprising.

In fact it would appear that no bird, however rare or small, is spared. We have even often seen the sparrow-hawk amongst the number, and have certainly felt less pity for his fate than for that of some of the other victims. On one occasion we noticed what appeared very like some old lady's favourite parrot. All these birds find ready purchasers, and many of them are regularly served up at the hotels and restaurants, forming dainty little morsels which no doubt Englishmen often partake of with relish, although at the same time they condemn the practice of sacrificing to a greed for delicate food these smaller members of the feathered tribe, which while they live confer so much real benefit on man by destroying myriads of insects, many of which are so destructive to vegetation and fruit. So greatly are these small birds in demand, that in nearly every direction round the larger towns of the Riviera, the killing of them is made a regular pursuit. So-called 'chasseurs' may daily be seen prowling down lanes, around gardens and private enclosures where birds congregate, often alarming and annoying passengers and the occupants of the houses. On Sunday the nuisance is often greater than on other days, for no sooner are the occupants of the Villas, mostly visitors, at church, than the reports of the murderous guns are heard: then when the season is over, and the Villas vacant, advantage is taken of the opportunity to shoot down all the small birds, which have found in the surrounding gardens shelter and protection during the winter. Further reference to this subject will be found in Chapter IV. In our quiet walks among the olive groves of San Remo the report of the guns of these small-bird killers may nearly always be heard, even throughout the spring and during the time of breeding. There is a law for the protection of birds during this season, *but it is obviously* not strictly enforced, which it might readily

be, since the men who make it their business to kill these birds, all pay for a licence and are well known to the authorities. For birds of passage the law does not afford any protection whatever, and these may be slain at any time.

Thus while we commend the French and Italians for discarding prejudice and having recourse to so many unused sources of food supply, we must emphatically condemn the wholesale and indiscriminate slaughter above described. But the shooting of these small birds is not the worst feature in the matter; not only are they thus ruthlessly shot, but they are often treacherously snared. An Italian medical man, in his work on the climate of San Remo, thus writes on this subject: 'In the depth of winter, when the mountains are covered with snow, the little birds who love the heights descend on to the slopes of the Apennines and thus to many points of Liguria; the capture with a net, "la chasse au filet," in situations sheltered from the wind then becomes a pleasant excitement, particularly on very cold days.'

It is stated that the prices of most articles of food at San Remo have become nearly doubled within the last few years, but on the whole living is still somewhat cheaper there than in some parts of England. The really dear articles, owing to the high duty charged, are tea, sugar, flour, bread, and salt. Wheat is subject to a tax at the mill, called 'Macinato.' This tax or duty has yielded a revenue of 80 millions lira or francs, and has no doubt hitherto helped to increase the cost of flour and bread. Recently, however, one-half of the tax has been remitted, and shortly the other half will be abolished, when it is to be hoped bread will become cheaper. At present it is much dearer than it is in England. The manufacture of salt is a Government monopoly, and hence it is dear. People are not allowed to take even a pailful of water out of the sea for a foot-bath, or for any purpose whatever, without a special permit. Tobacco is another Government monopoly. All articles of food of English manufacture are of course exceedingly dear.

Not only has the price of nearly all articles of food risen considerably during the last two years, but the value of Italian money has also undergone a great rise. Little more than four years since the exchange for an English sovereign reached as much as 28·80 lira, and for a Napoleon 23·60 lira; now the exchange is in the one case 25·00, and in the other, 20·00, with but 5 or 10 centimes over occasionally. While Italians are to be congratulated on this increase in the value of their money, the expense of living in Italy is of course proportionately enhanced to the foreigner.

CHAPTER III.

THE CLIMATE OF SAN REMO.

Geology of the District—Factors of a Climate—Prevailing Winds—Table of Winds—Sea and Land Breezes—Order of Succession of Winds—Tables of Strong and Moderate Winds—Variation of Meteorological Observations—Divisions of the Seasons—Temperature—North Shade Temperature—Temperature of San Remo and other Health Resorts contrasted—Night Minimum Temperature of San Remo and London contrasted—Sun Heat and Sunshine—Duration of—Days of—Warmth of the Mediterranean—Its Saltness—Relative Humidity—Tables of Relative Humidity—Rain—Duration of—Days of Rain—Rainfall—Table of Rainfall in other Health Resorts—Climate of San Remo contrasted with that of London—Fall of Temperature at Sunset—Difference between Shade Temperature and Sun Heat—Chief Characteristics of the Climate of the Riviera—Winter in the Riviera—Opinions of Medical Writers relative to the Climate of San Remo—Table of Mean Temperatures.

SINCE the geological features of a district influence greatly its climate in many ways, a brief sketch of the geology of San Remo and the neighbourhood may now be given before entering upon the question of weather and climate. The hills and mountains which form the protecting amphitheatre of San Remo are full of interest and instruction for the geologist.

Owing to the upheaval and fracture of some of the mountains, the various strata of which they are composed are in many situations plainly visible, some of the secrets of the earth's formation and past history being thereby disclosed.

The higher mountains are composed of limestone, the stratum forming them consisting of what has been termed geologically the lower cretaceous which corresponds to the lower greensand and Wealden beds of England. It abounds in minute marine fossilised animal organisms. Upon this rests the middle cretaceous stratum equivalent to the upper greensand and gault of England, and it also contains fossils. It is formed of layers of grey and blue argillaceous and sandy shales, with intervening thin laminæ of micaceous sandstone, more or less replete in *the cretaceous* greensand, including also some beds of argillaceous

limestone, imbedding layers of nodules of genuine chalk flint. This again is succeeded by the upper cretaceous stratum, corresponding to the white chalk and chalk marls of England: this stratum consists of beds of loosely cemented yellowish grey sandstone, and imbedded in some of them are more or less angular pebbles.

The three strata just mentioned belong, according to the late Professor H. D. Rogers, to the upper secondary formations, although by some the middle and upper strata are regarded as tertiary.

The next strata are all tertiary. The first of these is the middle eocene, there being, according to the authority above quoted, no lower or upper eocene and no miocene; this consists of a thin limestone, abounding in fossil nummulites, and is much used as a building stone..

The next stratum is formed of the pleiocene clays, made up of beds of blue and whitish clays, containing many characteristic marine fossils.

The uppermost or last stratum is the pleiocene conglomerate, or 'puddingstone,' containing rounded water-worn pebbles of various sizes up to even two feet in diameter. The above details, which may be said to apply in the main to a considerable portion of the Western Riviera, and not merely to that which includes Mentone, San Remo, and the parts more immediately adjacent, are derived from the Geological Chart prepared by Professor Rogers for Dr. Bennet's work, entitled 'Winter and Spring on the Shores of the Mediterranean,' a charmingly written and very important work which all travellers should read.

Examples of the layers forming the middle cretaceous stratum may be seen near the shore at a little distance from Capo Verde, which forms the eastern boundary of the Bay of San Remo, and also near the Pont St. Louis at Mentone and elsewhere. Examples of the upper cretaceous stratum are to be found between the St. Louis bridge and Ventimiglia, and inside the San Remo and Mentone amphitheatres; indeed, the olive-clad hills of these consist mainly of sandstone. The parapet or coping of the wall forming the southern boundary of the Jardin de l'Impératrice at San Remo consists of the upper cretaceous sandstone, and it forms, like the middle eocene, a very excellent building stone. The same stratum is also met with in many other situations. The blue stone of the middle eocene is to be found in many localities, and especially where there are quarries. Very fine specimens may be seen in the stone quarry now in course of being worked at the extremity of Capo Nero. The formation of a large quarry in such a situation is much to be regretted, as in time it will diminish the important protection

afforded by the Cape in its present form against the north-west and west winds.

There are several other stone quarries near San Remo, nearly all of which present features of interest to the geologist.

The pleiocene clays are found at San Remo especially, it being partly built on them, also at Ventimiglia, Mentone, and Roccabruna. Lastly, the pleiocene conglomerate is widely distributed; it is found at Ventimiglia, and the town of Roccabruna is built on it.

The conglomerate formation observed at Roccabruna, 'the brown rock,' and at Ventimiglia, extends over an immense area between the Esterels and San Remo, and on the south side of the Maritime Alps. In some regions also it attains extreme development. Thus it is found on the course of the Var and of the Vesubie, as also on a great part of the right side of the Roya valley. On the left side it principally forms the mountainous elevation which separates the Roya from the valley of the Nervia. Above Bordighera, at the Testa di Alpe, according to Dr. Nièpce, of Nice, it attains an elevation of above 5000 feet.' (Bennet.)

The primary or igneous rocks are not represented at San Remo or Mentone: they are found, however, at Beaulieu, Villefranche, Antibes, and in the valley of the Roya.

Dr. Onetti, in his work on the climate of San Remo, writing of the clay, thus expresses himself: 'In the tertiary formation there exists a vast basin of yellow clay, suitable for potters' use, and known under the name of figuline. It forms large masses alternating with little deposits of sand and stones, and encloses specimens of different univalve and bivalve shells, of echinidæ, and particularly of Briosopsis genei, as also numerous débris of leaves of cotyledons, which in their shape call to mind the appearance of the Plane and the Evergreen Oak. This clay extends from the hill of the Sanctuary of the Madonna della Costa, to a part of the valley of San Francia. We close these few remarks by informing the reader that in the upper sediments layers of stones conglomerated with sand are met with, the whole being cemented with the valves of pectens and oysters.'

Now, the preceding details are replete with interest, the geology of a district, as already remarked, influencing greatly the climate, and so bearing upon the question of its salubrity and suitability for invalids; it likewise exerts a most important influence on the character, composition, and fertility of the soil, and the fitness of this to the growth of certain kinds of trees, shrubs, and plants.

It has already been remarked that the climate of any place is

made up of a great variety of circumstances or factors—as situation, including latitude and longitude, surroundings or topography, direction, force and frequency of the winds, shade temperature, sun heat and its effects on the neighbouring mountains and the Mediterranean sea, duration of sunshine, relative humidity, number of rainy days, the hours of rain, and the rainfall. I will now proceed to consider each of these points in succession, as they bear upon the climate of San Remo, and it should be remembered that in discussing the climate of that place, one is also considering to some extent that of the best and more sheltered parts of the Western Riviera.

The situation and surroundings of San Remo have already been described in the opening chapter of this work, and it is unnecessary to recapitulate what has already been stated on these points. I will now, therefore, pass on to consider the subject of the winds of San Remo.

Winds.

It has already been stated that the seashore along the whole line of the Western Riviera is sheltered to a greater or less extent by ranges of lofty mountains. It is to these that the special features of the climate of the Riviera are mainly due, the mountains influencing alike winds, rain, and temperature.

The prevailing winds of the San Remo district in the winter are Northerly, as will be shown hereafter. Owing to the height of the mountains forming the semicircle around the town, these winds blow over the district and strike the sea at some distance from the shore, although their effect in a reduction of the temperature is still felt in a marked degree.

The north winds pass over the high mountain-chains of Europe, the north-east wind or Bise coming even from the Arctic regions; these winds thus become both cold and very dry, their moisture being lost as they blow over the higher Alpine mountains, on which it becomes precipitated in the form of snow.

Two of these chains are, the Alpes Maritimes, which attain in some places an elevation of several thousand feet, and more to the east, the Apennines; while behind the former, far inland, lie the higher Alps which separate Italy from Switzerland.

The North-West wind crossing over lower mountain-chains, and sometimes even the North Atlantic, is less dry than the north and north-east winds; but the latter, as also the east wind, are more moist and less irritating here than in England,

although they still retain in a minor degree the characteristics by which they are there distinguished. In consequence of the dryness and prevalence of the northerly winds during the winter, the whole aspect and character of land, sea, and sky are greatly affected. The winds being deprived of moisture the sky is no longer shrouded by vapour, mists, and clouds, but is seen of its natural blue colour, which is strongly reflected in the water of the Mediterranean; the sun shines forth in undimmed splendour, and its rays reach the earth in full force, giving warmth to both animate and inanimate nature.

The sun sunk to rest, the day ended and night commenced, the moon and stars in their turn become visible, and shine forth with a brilliancy and beauty which must be seen to be appreciated, and which is utterly unknown in lands of vapour and of cloud. So clear is the sky that it is by no means an uncommon circumstance, both morning and evening, to see the sun and the moon at the same time. The remarkable fineness of the nights in the Riviera Dr. Marcet attributes in part to radiation from the earth, and in part to diminished evaporation. Not only is evaporation lessened, but on fine and clear nights a very considerable precipitation of moisture in the form of dew takes place, which must assist greatly in rendering the air drier and clearer.

The north-west wind, or much-dreaded Mistral, is occasionally experienced with great severity in some places on the north shore of the Mediterranean, especially to the west, as at Hyères, Cannes, and Nice; but this wind is felt to a much less extent the further we go eastward, as at San Remo, it sometimes not reaching the town as a north-west wind at all, but rounding Capo Nero it comes upon t as a south-west wind, at times cold, bracing, and exhilarating, but at others disagreeable from its dryness and the dust to which it gives rise. Many persons are apt to confound all winds accompanied by dust with the Mistral; and although the dust renders all such winds very disagreeable and trying, they are very different in their effects from the true Mistral.

It has been already stated that the valleys which separate the hills immediately around San Remo all terminate on the side of the encircling mountains, and that in these there is no opening or gap whereby the northerly winds can enter, so that in no situation do they blow directly on the town, their influence being mainly felt in the reduction of temperature which they occasion; and even when they do reach the town it is rather as south-east and south-west than north-east and north-west winds, they rounding the promontories, Capo Nero and Capo Verde.

The San Remo amphitheatre is of course fully exposed to the *Southerly winds*; these warm winds passing over the Atlantic

and the Mediterranean take up large quantities of moisture. This is especially the case with the South-West wind, which, after coming from the Atlantic, traverses the Mediterranean from Gibraltar to the Gulf of Genoa, reaching the coast surcharged with moisture, which readily becomes precipitated as rain, especially when brought into contact with the cold northerly winds. These winds are therefore both warm and moist, bringing to the district, and indeed to the Western Riviera generally, warmth and frequently rain.

The South-East wind originates in the deserts of Africa, which it leaves as a very hot and dry wind, but as it passes over the Mediterranean it takes up much moisture and reaches the shores of Southern Italy as a hot, moist, and very enervating wind, constituting the much dreaded Sirocco; but by the time it arrives at this part of the Western Riviera it has become, by its passage over the Apennines and the Corsican mountains, much dryer and cooler, and hence deprived in a measure of its injurious qualities. In the latter part of the winter it may even bring snow to this coast.

It is very frequently a matter of difficulty in many parts of the Riviera, and especially in the Mentone and San Remo amphitheatres, to determine from which direction the wind really does blow; this arises partly from the deflection of the wind caused by the mountains, and from the conflict which takes place when winds travelling from opposing quarters meet, and partly from the course of the winds being diverted as by the sea breeze, or by the promontories bounding the bay on either side. Thus, winds that are really northerly sometimes enter the bay as already remarked, under the guise of southerly winds. Hence we meet with different and somewhat contradictory statements in books as to which are the prevailing winds. At Mentone the prevailing winds are described as northerly, and the same is the case at San Remo, as shown in the following instructive table compiled at my request by Signor Rodi, of the official Meteorological Observatory at San Remo.

Prevalent Winds.

	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875
January	N	NW	NNW	NE	NE	N	NE	W	N	NW
February	NNE	NE	NW	NE	—	E-SW	E	W	ENE	NW
March	SSW	SW	WNW	NE	—	NE	E	E	NW	NE
April	W	E	S	W	E	E	W	W	W	—
May	S	W	W	W	E	E	E	W	W	—
June	SSE	W	W	W	E	E	E	E	E	E
July	S-WSW	E	WSW	W	E	SW	E-W	E	W	W
August	S-N	W	W	W	E	E	E-W	SW	W	—
September	NE	W	NW	E	E	E	—	SW	W	—
October	N	N	S	E	W	NE	W	N	E	—
November	N-NNW	N	NNW	NE	NE	NE	N	N	E	W
December	N	NNW	W-N	NE	NE	NE	E-NW	NW	NW	NW

It will be seen from the preceding table that while the northerly winds are the most prevalent during the winter months, easterly and westerly winds are also of frequent occurrence.

As in hot and tropical regions, the day or Sea breeze and the night or Land breeze are experienced on the coast of the Riviera during clear sunshiny weather, particularly in summer and to a less extent in winter. In summer the sea breeze begins as early as eight in the morning and ends about five o'clock in the afternoon, but in winter it does not commence until about eleven and ceases about three o'clock.

The explanation of the occurrence of the sea breeze is as follows: the air below and near to the contiguous mountains, becoming rarefied by the sun's heat, ascends and passes over their tops; the cool air from the sea at the same time constantly and continuously flows in towards the land, to be in its turn similarly heated and rarefied.

But, to quote Dr. Bennet, who has studied this subject closely, 'for a decided sea breeze thus to rise in winter there must be a strong wind blowing from some of the northern quarters. When this is the case, in the early part of the day until about eleven o'clock, the north wind only reaching the sea at some distance from the beach, owing to the mountain protection, leaves the water in shore calm or nearly so. The sea air that later rushes in to supply the place of the rarefied land air, pushing angry billows before it, is merely the north wind, which having passed overhead and gone out to sea, is pulled back by the mid-day heat. When the air is perfectly calm in the upper and lower atmospheric regions, the calm of the early morning continues all day because there is then no strong wind and angry sea to be drawn inland by the effects of land heat; the latter in winter is not sufficiently great to create this little monsoon when the atmosphere is in a state of complete repose.' Now this north wind thus pulled back in winter, it should be remembered, is often a very cold wind.

At night a contrary process is in operation giving rise to the land breeze; in this case, the heat of the sun being withdrawn, the cool mountain air descends to the sea. This land breeze especially in winter does not usually blow with any very great force, but when sudden changes of temperature take place between land and sea it may, and often does, come on with much suddenness and power, constituting a great danger to sailing vessels which may happen to be near the coast. It is in the ravines and valleys leading to the shore that this land breeze is mostly felt.

In the morning, between the subsidence of the land and the commencement of the sea breeze, there is usually a period of

calm lasting two or three hours, and a similar period of repose in the afternoon, the exact duration of which varies according to the length of the day and the amount of sunshine.

M. Teysseire, the veteran meteorologist of Nice, makes the following interesting remarks in reference to the daily order of rotation of the winds: 'The rotation of the winds takes place very regularly and in a marked degree during spring and summer. From the beginning of April till September, when the weather is fine and the atmospheric pressure a little below the average, a slight easterly sea breeze sets in directly after sunrise, and as soon as the land wind has ceased. This wind increases, and between ten and eleven blows from the south-east; increasing still, it blows due south about one o'clock; between three and four it has become stronger still, and blows from the south-west; then lessening, it becomes due west, and continues in that quarter till it dies away completely at sunset. The land breeze then springs up and blows all night from a point varying from N.N.W. to N.N.E. Sailors are well acquainted with this phenomenon, and their saying is that on this coast the wind follows the sun. In autumn and especially in winter this occurrence is much rarer. It is observed only in seasons of fine weather, and with rather high atmospheric pressure.'

Sea and land breezes, it is obvious, must exercise a considerable influence on the temperature of the air at and near the shore, the former making the air cool in the day and the latter having a similar effect at night, and it is to these breezes that the comparative coolness of the day and night during the summer at San Remo and in the more sheltered parts of the Riviera is to be attributed.

Notwithstanding the shelter afforded by the high mountain ranges, the shores of the Western Riviera are much subjected to the action of winds; these blow sometimes with violence, more particularly at the periods of the autumn and spring equinoxes. When, however, the air is calm and but little wind prevailing, the sea is smooth and the waves break on the shore in gentle cadence; but with a strong southerly wind the white-crested waves rise on the surface in quick succession as in the case of more northern seas, and dash on the beach with an angry noise. At these times the sea is full of life, freshness, and motion, and is very unlike what might be supposed when one reads in books that the Mediterranean is a land-locked and almost tideless sea. It is not, however, absolutely tideless, as it has a rise and fall of nearly one foot, while in consequence of the action of the winds the sea frequently advances and recedes several feet.

The number of days on which strong and moderately strong winds prevailed, and the direction from which they proceeded

are exhibited in the following tables for the three winter seasons of 1879–80, 1880–81, and 1881–82 :—

Scale of Winds, 0 *to* 4. *Strong Winds*, 3 *to* 4.

1879–80	NW	N	NE	E	SE	S	SW	W	No
November . .	—	—	1	—	—	—	—	2	3
December . .	—	—	—	—	—	—	—	2	2
January . .	—	—	3	1	—	—	—	1	5
February . .	—	—	—	2	—	—	—	1	3
March . .	—	—	—	2	—	—	—	—	2
April . . .	—	—	—	6	—	—	—	1	7
Total . .	None	None	4	11	None	None	None	7	22
Moderate Winds, 2 *in Scale.*									
November . .	—	—	—	2	—	—	—	1	3
December . .	1	—	—	—	—	—	1	1	3
January . .	—	—	1	—	—	—	—	2	3
February . .	—	—	—	2	—	—	2	—	4
March . .	—	1	—	5	—	—	3	3	12
April . . .	—	—	1	2	—	—	6	4	13
Total . .	1	1	2	11	None	None	12	11	38

Scale 0 *to* 4. *Strong Winds*, 3 *to* 4.

1880–81	NW	N	NE	E	SE	S	SW	W	No.
November . .	—	—	1	—	—	—	—	2	3
December . .	—	—	—	—	—	—	—	2	2
January . .	—	—	4	1	—	—	—	1	6
February . .	—	—	—	2	—	—	—	1	3
March . .	—	—	—	3	—	—	—	—	3
April . . .	—	—	1	5	—	—	—	1	7
Total . .	None	None	6	11	None	None	None	7	24
Moderate Winds, 2 *in Scale.*									
November . .	—	—	—	2	—	—	—	1	3
December . .	1	—	—	—	—	—	1	1	3
January . .	—	—	1	—	—	—	—	2	3
February . .	—	—	2	7	—	—	2	—	11
March . .	1	—	—	4	—	—	4	3	12
April . . .	—	—	1	2	—	—	6	4	13
Total . .	2	None	4	15	None	None	13	11	45

Strong Winds.

1881-82	NW	N	NE	E	SE	S	SW	W	No.
November . .	—	—	—	1	—	—	1	—	2
December . .	—	—	1	—	—	—	—	—	1
January . .	—	—	—	—	—	—	—	—	—
February . .	—	—	—	4	—	—	—	1	5
March . .	—	—	—	3	—	—	—	1	4
April . . .	—	—	2	1	—	—	—	4	7
Total . .	None	None	3	9	None	None	1	6	19

Moderate Winds.

November . .	—	—	—	—	—	—	2	2	4
December . .	3	—	2	1	—	—	—	—	6
January . .	1	—	2	2	—	—	—	—	5
February . .	—	—	1	—	—	—	—	1	2
March . .	1	—	—	1	2	—	—	1	6
April . . .	—	—	1	3	3	—	1	—	8
Total . .	5	None	6	7	5	None	4	4	31

These tables show that strong north-west winds are not prevalent during the winter season, that due north winds are rare, and that north-east, east, and westerly winds are rather frequent; they show also that strong winds prevailed on the average on twenty-two days, and moderate winds on thirty-eight days of the 182 days of the winter season.

The north-west wind, or Mistral, is not of frequent occurrence at San Remo, and does not blow with anything like the force with which it prevails in the towns of the Riviera which lie more to the west. People in general who understand but little about the winds are apt to regard all winds coming from the west, and especially if accompanied by dust, as the Mistral; and hence this wind is often said to blow when it really does not. East winds, it must be remembered, while still preserving some of their bad characteristics, are not nearly so trying as they are in England. Against the north-east wind the protection afforded is very considerable, but it is less complete against the east wind—Capo Verde, the eastern protecting headland of the bay, having an elevation of only about 350 feet, while the height of the western headland is about 800 feet.

San Remo, then, and indeed the whole of the Western Riviera, must be regarded as windy. The winds, doubtless on some occasions, interfere with the comfort and movements of some invalids, and they constitute a drawback of what is otherwise an excellent

climate. On the other hand, it must be remembered that winds play a very important part, particularly in warm climates, in purifying the air, and exert, also, for the most part, tonic effects on the system.

It is near the sea that the full force of the wind is experienced. Further away from the sea, as in the Berigo road, they are much less felt; in fact, the air is often calm there when there is a strong wind below.

Temperature.

Having briefly referred to the principal causes—namely, its southerly position, 460 miles south of London, and mountain protection—which combine to impart to the Riviera, especially in the winter, its exceptionally mild character, I will now give the figures of the actual north shade temperature of San Remo; but before doing so it will be well to enter into a few details respecting meteorological observations generally.

The temperatures given in books, unless when otherwise stated, are shade temperatures: that is to say the instruments are placed in such a position that the direct rays of the sun do not reach them, and so do not raise the column of mercury; but it is not always stated whether the instruments thus shaded are placed in a southern or northern aspect. Now, the indications afforded by thermometers in a north aspect will, under the same circumstances of time and weather, be some degrees lower than in a south aspect.

Then, again, the results will vary according to the manner and times at which the observations are taken. Some observers are content with two observations each day, others consider three necessary; further, there is no uniformity in the hours selected for recording the results. Some take the maximum and minimum temperatures only by means of self-registering instruments; this is the easiest, and perhaps on the whole the most certain and satisfactory way, and although the results obtained by the two methods are not identical, yet they very closely correspond. Furthermore, the temperature is influenced by a variety of surrounding circumstances, as the proximity of radiating media, such as rocks, walls, banks, the surface of the earth, and the vegetation. All these render it exceedingly difficult to obtain, even in the same town, two sets of observations which precisely correspond, and the difficulty of course is increased in the case of different localities, so that implicit reliance is not always to be placed on comparisons of one locality with another, when the differences of temperature are not very considerable. Neither can absolute reliance be placed on a comparison of the medium temperatures of one town with those of another; thus two *places may furnish* the same media and yet the climate be totally

different. For example, the winter medium of 60° Fahr. would indicate a mild climate, but this medium might be made up of very cold nights and very hot days, as has been shown by Dr. Dalrymple to be the case in the Upper Nile. Even season media are not sufficiently detailed to allow of the character of a climate being judged of accurately. The points to be noticed particularly in comparing one place with another are the frequency with which the highest and lowest points are reached, and the extent of the variation between the two places.

Notwithstanding the pains and labour which have been bestowed upon meteorological records, and the great number of observers who have directed their attention to meteorology, the information as yet acquired is in many cases not nearly so complete as is to be desired, or might be imagined. The records of the early observers are in some cases open to doubt in consequence of the imperfection of the instruments used and of the methods employed. Then, again, the records of a few months, or of a single season, however accurate, go but a little way in determining the character of the climate of any particular place: this can only be satisfactorily done by taking the averages of a series of years.

The custom in England is to divide the year into four equal portions or seasons of three months each: the first three months being called spring, the second summer, the third autumn, and the fourth winter. This is a very arbitrary, and at the same time a very artificial division; in the first place the seasons are not of equal length, and in the second the two coldest months of the year are usually December and January, and yet one of these months only, according to the practice above referred to, belongs to the winter, and the other to the spring. The Italians, having more regard to the actual seasons, have adopted a more natural division; they also divide the twelve months into four equal periods, but the winter with them begins December 1, and the autumn terminates November 30; but this arrangement has the great disadvantage of embracing portions of two years and not being, as is the English method, complete in the one. Neither plan, therefore, can be regarded as altogether satisfactory. Even the duration of the seasons varies with the climate and the country; in England five months might fairly be allotted to the winter.

Having recourse again to the records of the Meteorological Observatory at San Remo, I find, according to the English division of the year, the average three months' spring temperature for nine consecutive years to the end of 1874 to be 49·81°; the average summer temperature 68·04°, the autumn 72·27°, and the winter 55·21°, the mean annual for the nine years being 60·08° Fahr. Of course the average temperatures of the seasons varied with the years, the extent of the *variations* being shown in the following table:—

Year	Spring	Summer	Autumn	Winter	Annual
1866	51·69	62·00	70·88	57·02	60·40
1867	50·41	63·62	71·99	54·28	60·08
1868	49·11	65·60	73·92	56·49	61·28
1869	48·84	63·68	70·59	54·59	59·42
1870	49 15	64·29	71·15	54·17	59·69
1871	49·19	61·93	72·48	52·52	59·03
1872	51·49	62·43	73·29	56·95	61·05
1873	51·56	62·52	74·26	57·14	61·37
1874	46·83	61·30	71·87	53·70	58·43

Following the Italian rule for the division of the year, which is that usually adopted in warm climates, the figures stand as follows :—

Year	Spring	Summer	Autumn	Winter	Annual
1865–66	56·34	71·03	62·76	50·55	60·17
1866–67	57·76	71·82	61·17	49·86	60·16
1867–68	58·04	75·20	62·11	47·53	60·72
1868–69	57·10	72·83	62·31	50·38	60·66
1869–70	58·03	73·45	63·11	48·64	60·81
1870–71	58·10	69·93	62·35	46·69	59·27
1871–72	57·90	71·86	62·70	48·30	60·19
1872–73	58·32	74·10	60·48	50·57	60·87
1873–74	54·31	71·83	59·74	47·50	58·35

The above figures give a mean winter temperature of 48·89°; spring 57·32°; summer 72·45°; autumn 61·86°, and a mean annual temperature of 60·13°, which differs only very slightly from the mean annual based upon nine years commencing January 1.

The monthly variations of temperature during the nine years over which the observations extend, are shown in the annexed table :—

	1865–66	1866–67	1867–68	1868–69	1869–70	1870–71	1871–72	1872–73	1873–74	Mean
November .	55·27	52·44	52·43	52·98	53·04	54·53	52·75	55·56	52·88	53·54
December .	48·09	50·84	46·40	53·15	50·45	45·66	44·33	52·80	50·64	49·25
January .	49·20	47·85	46·45	46·25	45·51	44·79	49·19	50·52	45·33	47·23
February .	53·45	50·91	49·76	51·74	49·96	49·64	51·38	48·39	46·54	50·19
March .	52·43	52·50	51·13	48·54	51·98	53·15	53·94	55·79	48·59	52·00
April .	55·97	58·04	55·74	57·03	57·57	57·92	58·33	56·73	56·04	57·04
May .	60·63	62·76	67·26	65·75	64·56	63·23	61·43	62·45	58 30	62·93
June .	69·42	70·09	73·81	68·27	70·73	64·68	67·56	68·43	69·55	69·17
July .	73·36	72·12	75·23	76·06	75·59	71·51	74·04	76·48	74·62	74·33
August .	70·32	73·25	76·58	74·17	74·03	73·61	73·97	77·39	71·33	73·85
September	68·95	70·64	69 96	72·35	72·50	72·17	69·93	68·92	69·69	70·57
October .	66·90	60·46	63·39	61·55	62·31	62·13	62·58	59·64	57·27	61·80

The above figures prove that December and January are by far the coolest months, the latter being the coldest; that February ranks next, and then in order March, November, and April. The hottest month is July, and then follow August, September, and June. It is a curious circumstance that the mean temperature of the nine years for May, June, and July, 68·81°, is almost identical with that for August, September, and October, namely, 68·74°.

The preceding figures, however, fail to furnish all the information required. The winter season at San Remo may be said to extend from November 1 to the end of April; what, therefore, has to be ascertained, since it is this which chiefly concerns visitors and invalids, is the mean temperature for that period, and this will be found set forth in the next table.

The mean of the following nine seasons is 51·55° Fahr.:—

Seasons	Average Temperature	Seasons	Average Temperature
1865–66	52·58	1869–70	51·42
1866–67	52·10	1870–71	50·95
1867–68	50·32	1871–72	51·65
1868–69	51·62	1872–73	53·30
1873–74	50·00		

It is much to be regretted that owing to some omissions in the registration the observations taken at the San Remo Observatory could not be brought down continuously to a later date; and especially that full details are not forthcoming relative to the winter season of 1878-79, which was one of an unusually severe character.

During the past four winter seasons I have taken with Negretti and Zambra's best instruments, corrected at the Royal Kew Observatory, a comprehensive series of meteorological observations. Those for the seasons 1879–80, 1880–81, 1881–82, were read at the several annual meetings of the British Medical Association, and were published in the Journal of the Association. They embrace the shade temperature at three periods of the day—9 A.M., 3 P.M., and 9 P.M.—the maximum shade temperature of the day, the minimum temperature of the night, both in the air and on the ground, the sun's heat as registered by both the black bulb and solar radiation thermometers, the number of sunshiny days, the duration of sunshine, the temperature of the sea, the relative humidity of the air, the number of days and hours on which rain fell, the amount of the rainfall, and many other particulars. In fact, I know of no other series of observations of equal interest and significance relative to a health resort; and numerous as are the particulars recorded, they are indispensable to the right understanding of the climate of any place.

The first series of observations relate to the north shade day and night temperatures, and are summarised for the three seasons specified in the following tables.

The minimum thermometer placed on the grass or earth indicates not merely the lowest temperature of these during the night, but should rain or dew fall on the bulb, as is often the case, also the cold produced by evaporation of the moisture.

Mean Monthly North-Shade Temperature, Season 1879–80.

	9 A.M.	3 P.M.	9 P.M.	Mean Monthly	Mean Day Range[1]	Greatest Day Difference	Mean Night Minimum	Mean Day Maximum	Mean of Maxima and Minima
November . .	52·60	56·60	51·40	53·50	6·8	13·4	48·40	59·40	53·90
December . .	43·50	49·90	42·20	45·20	8·3	13·1	39·20	51·80	45·50
January . .	45·50	52·10	44·98	47·54	7·8	14·0	40·80	53·30	47·00
February . .	50·07	55·89	48·55	51·50	5·8	11·5	45·61	57·32	51·46
March . .	55·00	58·60	51·40	55·00	5·1	8·8	47·70	60·10	53·90
April . . .	59·90	61·70	56·30	59·30	4 3	10·0	52·80	64·10	58·40
Mean of Season	51·09	55·80	49·14	52·00	6·3	11·8	45·76	57·67	51·70

The mean temperature for the whole season, deduced from the three daily readings, was 52·00°; and from the maxima and minima readings, 51·70°.

The preceding observations are fully confirmed by those taken for the same season at the Official Meteorological Observatory in San Remo, as will appear by an examination of the subjoined table :—

Mean Monthly Temperature at the Meteorological Observatory at San Remo.

	9 A.M.	3 P.M.	9 P.M.	Mean Monthly	Mean Night Minimum	Mean Day Maximum	Mean of Minima and Maxima
November . . .	53·2	57·2	51·3	53·9	47·6	59·7	53·6
December . . .	45·2	51·0	44·0	46·7	40·4	53·4	46·9
January . . .	46·4	53·0	46·4	48·6	41·2	55·2	48·2
February . . .	51·2	56·8	50·3	52·8	47·1	58·6	52·8
March . . .	55·5	60·0	53·3	56·3	48·8	62·3	55·6
April	60·1	63·6	57·2	60·3	53·5	66·1	59·8
Mean . . .	51·9	56·9	50·4	53·1	46·4	59·2	52·8

[1] *The difference* between the 9 A.M. and maxima readings.

According to the above table, the mean temperature for the whole season, deduced from the three daily readings, is 53·1°, and, from the minima and maxima readings, 52·8°—being in both cases exactly 1·1° Fahr. higher than my own readings.

From an examination of the table for the season of 1879–80 it appears further that the two coldest months were December and January, the means being 45·20° F. and 47·54° respectively; the next coldest months were February, and then November, the two warmest being March and April, the means for which were 55·0° and 59·30°.

The mean for the whole season was 52·00°.

The mean of the 3 P.M. readings was 55·80°, and of the maxima or mid-day readings 57·67°, rising to 64·10° in April.

The nights of December and January were also the coldest of the season: the mean minimum temperature for the first month being 39·20° and for the second 40·80°, reaching to 52·80° in April. The mean for the whole season was 45·76°.

The mean daily variation was only 6·3°, and the greatest day difference 14°, which occurred in January.

These figures are particularly instructive. The winter season of 1879–80, both in England and in the Riviera, was one of exceptional severity, and yet the mean temperature was 52·00°, which is somewhat over the nine years' average of 51·55° already quoted. The mean of the maxima readings was nearly 58·00°, and it is to this higher or mid-day temperature that invalids are exposed; and this only when in the north shade, which they seldom are, since they naturally court the sun. Again, one of the most important points connected with the climate of any place is the extent of the daily range of temperature: moderate variations are beneficial, but great and sudden ones most trying, and frequently injurious. Now the results above recorded show an extremely limited diurnal range of temperature.

It further appears from my meteorological journal that the temperature fell slightly below the freezing point five times in December and once in January, the greatest degree of frost occurring on the night of December 9, when the thermometer stood at 27·9°. On several other occasions the temperature approached the freezing point, and on the ground and in exposed situations it even froze; and of course high up the valleys and on the hill and mountain tops, the cold reached several degrees of frost,—so great indeed was it that the lemon trees in some situations were injured. On December 1 snow fell to a depth of something under two inches, and it did not disappear until about eleven o'clock on the following day, and in northerly exposures it remained for a still longer period. This was a very unusual occurrence, both as to the quantity of snow that fell and the *time it remained* unmelted. Ordinarily the falls

of snow in and near San Remo are of the slightest description, and the flakes melt almost as fast as they fall. It is, however, by no means an uncommon circumstance in mid-winter to see the mountains surrounding the San Remo amphitheatre, above the limits of the olive-clad hills, more or less covered with snow, and this sometimes remains for two or three days consecutively, or even more.

The next table comprises the mean monthly north shade temperature for the following winter season—that of 1880–81.

Month	9 A.M.	3 P.M.	9 P.M.	Mean Monthly	Highest Temperature, Day	Lowest Temperature, Night	Mean Daily Range	Greatest Day Difference	Mean Night Minima	Mean Minima on Ground	Mean Day Maxima	Mean of Minima and Maxima
November .	56·9	61·5	54·7	57·7	70·3	43·7	5·9	11·8	51·9	48·9	62·8	57·4
December .	52·6	59·2	51·6	54·5	65·6	45·0	6·9	13·7	49·9	44·6	60·5	54·7
January .	45·3	49·8	45·1	46·7	59·1	33·0	5·5	12·8	42·7	39·0	50·9	46·8
February .	50·8	55·4	48·4	51·5	61·8	36·0	6·1	14·0	45·6	40·9	57·0	51·3
March . .	54·7	58·4	52·2	55·1	65·1	40·4	5·7	9·5	49·3	44·1	60·4	54·9
April . .	60·8	63·2	56·7	60·2	73·1	47·4	4·4	9·3	53·0	51·5	66·5	59·8
Mean of Season .	53·5	57·9	51·4	54·3	—	—	5·7	11·8	48·6	44·8	59·7	54·1

From the above table it appears that January was the coldest month, with a mean temperature of 46·7°; that February was the next coldest, with a mean of 51·5°, December and March being next in order; while the two warmest months were November and April, with means of 57·7° and 60·2°.

The mean for the whole season was 54·3°.

The mean of the 3 P.M. readings was 57·9° and of the maxima 59·7°, rising to 66·5° in April.

The nights of January and February were also the coldest of this season, the mean minimum temperature in the air for the first month being 42·7° and for the second 45·6°; rising to 53·0° in April, the mean for the whole season being 48·6.°

The mean of the night minima on the ground was 44·8°, being 3·8° lower than the night mimima in the air.

The mean daily variation of temperature was 5·7°, the greatest day difference being 14°, which occurred once only, in February.

The lowest temperature in the air for the whole winter was 33° Fahr., or one degree above freezing point; this occurred in *January*. *But on the* ground the thermometer descended on three

occasions below the freezing point, the degrees indicated being 30·5°, 31·5°, and 31·0° Fahr.

It appears, therefore, notwithstanding the severe and prolonged cold which prevailed in England and some other countries, that the winter season of 1880–81 was at San Remo an unusually mild one; the mean temperature, as already stated, being 54·3° against 51·5°, the mean of nine years' consecutive observations taken at the San Remo Observatory.

For some days in January snow was visible on the higher mountains around San Remo, which gave it a somewhat wintry appearance, and led to many adverse reports as to the severity of the season; but as appears from the data already given, those persons might indeed be regarded as fortunate who were enabled to spend the winter season of 1880–81 at San Remo.

The shade observations recorded in my reports for the winter seasons of 1879–80 and 1880–81 were made at an elevation of 48 feet above the sea, 30 above the ground, and at a distance of about 500 feet from the sea; those now about to be given were made 4 feet above the ground, 30 feet above the sea, and about 400 feet therefrom; the louvred box being even still more effectually protected than heretofore against the sun's rays.

In the following table, the chief particulars are given relative to the north shade temperature for the season 1881–82 :—

Month	9 A.M.	3 P.M.	9 P.M.	Mean Monthly	Highest Day	Lowest Night	Mean Daily Range	Greatest Day Difference	Mean Night Minimum	Mean Minimum on Ground	Mean Day Maximum	Mean of Minima and Maxima
November .	56·7	59·7	55·6	57·3	62 6	44·8	4·3	7·0	51·9	—	61·0	56 5
December .	49·8	54·3	50·1	51·4	58·2	41·1	5·5	11·1	46·3	—	55·3	50·8
January .	48·1	53·8	50·0	50·6	58·7	39 9	6·7	12·1	45·7	41·0	54·8	50·3
February .	50·8	54·6	50·0	51·8	62·8	38·0	5·5	11·0	45·9	41·0	56·3	51·1
March . .	55·6	60·0	52·8	56·1	69·2	43 0	5·4	12·2	48·3	43 1	61·0	54·7
April . .	58·9	62·2	55·9	59·0	69·5	43·9	4·4	10·1	50·9	46·8	63·3	57·1
Mean . .	53·3	57·4	52·4	54·4	63·5	41·8	5·3	10·6	48·17	—	58·6	53·4

No frost occurred during the whole of this season; the lowest temperature was on February 3, when the thermometer on the ground marked 33·4° and that suspended in the air 38·0° Fahr.

From this table, it appears that January was much the coldest month, with a mean temperature of 50·6° Fahr., December and

February being next in order, with a temperature of 51·4° and 51·8° respectively; that November and April were the warmest months, with a mean of 57·3° and 59·0°; that the mean of the three daily readings for the whole season was 54·4°, and the mean of the minima and maxima readings 53·4°; that the highest day temperature recorded was in April, 69·5°; and the lowest night temperature, 38·0°, in February. The lowest temperature on the ground occurred on February 3, namely, 33·4°; so that the freezing point was not once reached during the whole season, except in exposed places and situations. The mean of the 3 P.M. readings was 57·4°, and of the maxima readings 58·6°; and it is to these temperatures that visitors are exposed; and this, it should be remembered, only when they happen to be in the shade to the north; in the sun, of course, the temperature to which they would be subject would be much higher. A point of great importance to notice is the daily range of temperature; the greatest day range shown in the table is 12·2° in March, and the mean range for the whole season was only 5·3°; these figures showing that the shade temperature, at all events, varies within very moderate limits.

Comparing the above figures with those of the two previous seasons, the results stand thus :—

From the figures for the winter season 1879–80, it appears that the two coldest months were December and January, the mean for the former being 45·2°, and for the latter 47·5°. The two warmest months were March and April, the means being 55·0° and 59·3°, and the mean temperature for the whole season was 52·0° Fahr. The lowest temperature for the whole season was 27·9°. The thermometer in the air reached the freezing point five times in December and once in January; the winter climate, therefore, of San Remo for the season 1879–80 was, on the whole, a more than usually mild one, being above the average 51·5°, though colder than the seasons of 1880–81 and 1881–82.

The greatest day difference of temperature was 14·0°, and the mean of the six months 5·7°. The mean of the 3 P.M. readings was 57·9°, and of the maxima readings 59·7°.

From the observations for the next season, 1880–81, the conclusions were: that January was the coldest month, with a mean temperature of 46·7° Fahr.; that February was the next coldest, with a mean of 51·5°; that the two warmest months were November and April, the means being 57·7° and 60·2° respectively. The mean of the three daily readings was 54·3°, and that of the maxima and minima reading 54·1°. The lowest temperature in the air for the whole winter, namely, 33·0°, or one degree above *freezing* point, occurred in January. The mean of the night *minima observations* in the air was 48·6°, and on the ground

44·8°; the thermometer on the ground descended on three occasions below the freezing point, the degrees indicated being 30·5°, 31·5°, and 31·0° Fahr. The greatest variation of temperature on any one day of the season 1879–80 was 14·0°, and, for the season 1880–81, also 14·0°; the mean difference for the whole six months being, in the one case, 6·3°, and 5·7° in the other; the figures again show that the north shade temperature varies within very moderate limits.

The mean six months' winter season temperature for nine years ending 1873–74, as deduced from the observations of the Official Meteorological Observatory at San Remo, and which observatory was then placed at the top of the Palazzo di Città, was 51·5°; as shown in my work on 'San Remo and the Western Riviera,' the means for the three seasons recorded by me were, as has been just stated, 52·00°, 54·3°, and 54·4°, = 53·6° per season. The season 1880–81, it will be remembered, was a very severe one in England and many other countries. During the seasons 1880–81 and 1881–82, the temperature of the air, neither by day nor night, ever descended, even on a single occasion, to the freezing point.

The mean annual temperature of San Remo is 60·13° and the mean six months' season 51·55° or, according to my observations, 53·6°. Contrast the preceding figures of shade temperature with those for the three chief English Health Resorts. The mean annual temperature of Bournemouth for 9 years from December 1, 1866, to November 30, 1878, but omitting '72, '75, and '77, was 49·66°, and the mean six months' season temperature for the years above named was 43·31°. The mean annual temperature for Torquay from December 1, 1877, to November 30, 1878, was 50·23°, and that for the season 44·65°. Lastly, the mean annual temperature of Ventnor for the two years 1876–77 and '77–78 was 51·95°, and that for the two seasons 46·58°. The preceding figures, taking 51·55° as the basis of calculation, but which is certainly too low, show a difference in the annual temperature in favour of San Remo of 10·56° in the case of Bournemouth, of 9·99° in that of Torquay, and 8·27° for Ventnor; the differences for the seasons being respectively 8·24°, 6·90°, and 4·97°.

For the data upon which the calculations of the temperature of Bournemouth, Torquay, and Ventnor are based, I am indebted to the kindness of Mr. Humphreys, of the General Register Office. It is to be regretted that the observations for the two latter places do not extend over a longer period, but as far as they go they are thoroughly reliable, and I believe that had they done so, the general results obtained would not differ materially from those now recorded.

But the difference of temperature may be shown in a still more striking manner.

The winter of 1878-79 was the severest, both on the Riviera and in England, which has been experienced for some years, if we except that for the season 1882–83. In the following table the minimum night temperature is shown for the month of January at the gardens of the Royal Botanical Society, Regent's Park, London, and at San Remo for the same period. The records at the latter place were kindly furnished me by Major Toone.

1879	Regent's Park	San Remo	1879	Regent's Park	San Remo
January 1 .	42·0	47	January 17 .	29·0	41
,, 2 .	28·5	50	,, 18 .	29·5	40
,, 3 .	28·0	47	,, 19 .	31·4	43
,, 4 .	27·0	46	,, 20 .	27·0	40
,, 5 .	24·0	42	,, 21 .	26·8	42
,, 6 .	20·0	37	,, 22 .	27·8	51
,, 7 .	28·7	39	,, 23 .	23·0	55
,, 8 .	25·0	38	,, 24 .	28·0	54
,, 9 .	24·0	34	,, 25 .	27·0	49
,, 10 .	24·0	40	,, 26 .	30·0	48
,, 11 .	20·0	40	,, 27 .	32·0	46
,, 12 .	16·0	41	,, 28 .	30·0	47
,, 13 .	28·0	44	,, 29 .	28·8	44
,, 14 .	37·0	44	,, 30 .	30·8	44
,, 15 .	36·0	44	,, 31 .	28·5	44
,, 16 .	26·0	44			

It will be seen from an examination of the above table that on January 23, the difference of temperature between the two places amounted to 32° ; the mean daily difference for the whole month was a little over 16°.

But Dr. C. T. Williams has brought into even still stronger contrast, in the following table, the great difference which frequently exists between the winter temperature of the north shore of the Mediterranean and England :—

1867	Minimum		Maximum	
	Kew	Hyères	Kew	Hyères
January 2 .	19·9	50·0	28·7	54·0
,, 3 .	5·7	52·0	28·6	55·0
,, 4 .	5·0	54·0	16·4	57·0
,, 5 .	1·0	52·0	30·8	56·0
,, 14 .	10·5	58·0	29·8	65·0
,, 15 .	14·3	56·0	31·3	64·0
March 17 .	27 3	53·0	36·9	67·0
,, 18 .	11·5	55·0	32·7	67·0

The difference shown in the above table is really extraordinary, and amounted on one occasion to no less than 51° Fahrenheit; indeed the cold of Europe does not appear to have penetrated to Hyères at all in that year.

Sun-heat and Sunshine.

The chief particulars relative to the sun-heat and sunshine at San Remo for the past three winter seasons will be found embraced in the following tables.

The temperature indicated by the solar radiation thermometer is the heat imparted by the direct rays of the sun, *plus* the ordinary shade temperature; the actual solar temperature is the difference between the two readings. Again, it should be remembered that the sun's rays act with greater power on the thermometer the greater the altitude; this arises mainly from the fact that the air is usually much dryer, and therefore that the sun's rays pass through it more easily. 'On the Peak of Teneriffe at 9,000 feet, according to the astronomer, Mr. Piazzi Smyth, the sun raises the black bulb thermometer *in vacuo* to the temperature of boiling water at the seaside; while oddly enough in winter at Davos, 5,000 feet above the sea, and in the midst of snow and ice, the sun is warmer than at Cannes and in the blue sky of the Mediterranean seaside.' (Marcet.)

Sun-heat and Sunshine, Season 1879–80.

	Maximum Sun-heat	Average Sun-heat *in vacuo*	Days of Sunshine	Hours of Sunshine	Possible Sunshine	Mean Daily Sunshine
				h. m.	h. m.	h. m.
November .	—	—	24	182·00	286·07	7·58
December .	120·3	113·0	28	226·00	271·30	8·07
January . .	128·0	114·3	30	227·17	279·04	7·34
February .	135·6	118·5	27	208·42	293·28	7·46
March . .	135·4	123·1	29	264·14	363·38	9·10
April . .	146·1	129·7	28	222·37	398·13	7·57
Mean . .	133·08	119·72	27·6	221·4	315·20	8·05

From the foregoing table it appears that the mean sun-heat for the season, as recorded by Negretti & Zambra's vacuum solar radiation thermometer, was 119·72, the mean maximum sun-heat being 133·08; that the number of days on which the sun shone was 166, thus leaving only sixteen days during the whole six

months on which the sun did not shine; that it shone for 1,330 hours out of a possible sunshine of about 1,891 hours, equal to no less than eight hours per day, excluding the sixteen days above referred to. Of course some of the days on which the sun shone were days of partial sunshine only, with cloud in some cases or rain in others.

The figures for the season 1880-81 were :—

Sun-heat and Sunshine, Season 1880-81.

	Average Sun-heat *in vacuo*	Maximum heat *in vacuo*	Average Sun-heat in Air	Maximum heat in Air	Excess of Vacuum S.R. Thermometer	Days of Sunshine	Hours of Sunshine	Possible Sunshine	Mean Daily Sunshine
							h. m.	h. m.	h. m.
November .	118 6	130·8	73·0	83·7	45·6	25	190·26	286·07	7·37
December .	114·9	130·7	77·1	83·6	37·8	29	193·24	271·30	6·40
January .	—	—	61·9	77·3	—	23	119·01	279·04	5·10
February .	—	129·0	72·2	93·0	—	24	183·03	293·28	7 41
March .	123·2	139·4	73·8	80·7	49·4	30	219·07	363·38	7·18
April . .	129·7	144·0	80·0	86·4	49·7	29	272·00	398·13	9·22
Mean .	121·6	134·8	73·0	84·1	45·6	26·6	196·10	315·20	7·18

From an examination of the above table it appears that the average sun-heat *in vacuo* for this season, omitting January and February, was 121·6°; that the mean maximum sun-heat *in vacuo*, omitting only January, was 134·8°; that the average sun-heat in air, including all months, was 73·0°, and the mean maximum sun-heat in air 84·1°; the mean excess of the sun-heat *in vacuo* over that in air was therefore no less than 48·6°. Now it should be clearly understood that the degree of heat denoted by the vacuum solar radiation thermometer is not one to which the human body under ordinary circumstances is exposed, since it cannot, like the bulb of a thermometer, be placed *in vacuo* and be wholly protected from currents of air and moisture. Neither, indeed, does the ordinary sun thermometer, with its blackened and naked bulb, indicate the true temperature to which the body is subject, since the latter is not naked but clothed, and hence protected to some extent from the action of currents of air.

It appears further from the table that there were 160 days out of a total of 181 days constituting the six months' winter season on which the sun shone, leaving but twenty-one sunless days; that the number of hours during which the sun shone was *1,177, against* a possible sunshine of 1,891 hours, and that the

mean daily sunshine amounted to 7 hours 18 minutes. This mean includes only the days on which the sun actually did shine, but spreading the sunshine over all the days of the season it would amount to 6 hours 30 minutes. Comparatively bright and sunshiny as was the winter season of 1880–81, it was less so than the previous season, in which there were 166 days of sunshine and 16 cloudy days, the daily duration of sunshine being a little over 8 hours, as against 7 hours 18 minutes for the season of 1880–81.

Season 1881–82.

Month	Average Sun-heat in Vacuum	Maximum Sun-heat in Vacuum	Average Sun-heat in Air	Maximum Sun-heat in Air	Excess of Vacuum Thermometer	Days of Sunshine	Mean Daily Sunshine	Hours of Sunshine	Possible Sunshine
							H.M.	H. M.	
November . .	110·0	118·5	73·9	83·6	36·1	24	7·42	184·47	284·54
December . .	101·3	107·1	71·0	70·9	30·4	28	6·56	194·12	262·09
January . . .	109·1	118·0	68·3	73·0	36·1	29	6·35	184·20	284·02
February . .	114·0	123·2	67·8	75·0	39·0	26	9·08	237·41	290·22
March . . .	125·7	132·2	74·2	85·4	40·3	30	10·04	302·07	368·29
April	128·1	136 0	75·4	84·7	43·4	30	10·19	309·45	403 47
Mean . . .	114·7	122·5	71·8	78·8	37·5	167=27·8 per month	8·27	1412·52 = 235 per month	1893·43

From an examination of the above table, it appears that the mean sun-heat *in vacuo* for the season 1881–82 was 114·7°, that the mean maximum sun-heat was 122·5°; the mean sun-heat in air was 71·8°, and the mean maximum sun-heat in air 78·8°, the mean excess of sun-heat *in vacuo* over that in the air being 42·9°.

It appears further from the table that there were 167 days out of a total of 181 days constituting the season, =27·8 days per month on which the sun shone: that the number of hours of sunshine was 1,412 = 235 hours per month, and 8 hours 27 minutes per day, out of a possible sunshine of over 1,893 hours. There were thus only 14 days of the whole six months on which the sun did not shine.

These means include only the days on which the sun did actually shine; but, spreading the sunshine over all the 181 days, whether sunshiny or cloudy, the figures would be somewhat different: the average sun-heat *in vacuo* would be 111°, and in air 70·5°, while the mean daily duration of the sunshine would be 7 hours 49 minutes. The above figures abundantly establish the fact of the bright and sunshiny character of the climate during the season 1881–82: the readings for the two previous seasons may be quoted in further corroboration of the brilliancy of the climate. During

the season 1879–80 there were 166 days on which the sun shone, and the duration of the sunshine was 1,330 hours; equal to no less than 8·05 hours of sunshine per day. During the season 1880–81 there were 160 days of sunshine, the sun shining 1,177 hours, with an average for each sunshiny day of 7 hours 18 minutes.

The above statistics of the sun-heat and of the number of fine and sunshiny days certainly convey a most pleasing feature of the climate of the more sheltered parts of the Riviera, and they show how immeasurably superior it is to our English climate. In our own country the invalid in winter is kept in the house for days and even weeks together, whereas the days on which he cannot enjoy the benefits of fresh air, exercise, and even sunshine, are here comparatively few.

The preceding figures tell very strongly in favour of the climate of San Remo, and prove that it well sustains the reputation of the 'Sunny South.'

Reviewing all the tables, it appears that the average sun-heat *in vacuo* for the three seasons was 118·7°, and in the air 72·4°; that the mean north-shade temperature for the same seasons was 53·1°, showing a difference of 65·6° in favour of the sun-heat, as recorded by the vacuum solar radiation thermometer, and 19·1° by the ordinary black bulb thermometer. These figures may be accepted as proving the great power of the sun at San Remo, and indeed in the Western Riviera generally, even during the winter season.

But the sun contributes to the warmth of the Riviera, not only by its direct rays, but indirectly; thus some of the rocks and mountains around San Remo, as well as elsewhere in the Riviera, consisting chiefly of limestone, and being bare of vegetation, absorb during the day, especially in summer, a large amount of caloric or heat; this being gradually given off again during the night and the colder months of the year, helps greatly to increase the temperature.

Again in the same manner the Mediterranean absorbs and stores up heat during the day, particularly in summer, gradually parting with it at night and during the colder period of the year. It must not be forgotten, however, that the remarkable warmth of the Mediterranean is in part due to its very slight admixture with the colder water of the Atlantic, which at a depth of 100 fathoms is about 20° colder than the Mediterranean at the same depth and in the same latitude, this colder water entering only through the Straits of Gibraltar. Were the water of the Atlantic to enter more freely it would not be possible for this sea to retain its warmth. The Mediterranean, therefore, exercises an important influence in raising and equalising the temperature of the

places upon its shore, and helps to explain in part their freedom from frost.

The chief facts relative to the temperature of the Mediterranean are embodied in the subjoined tables.

Temperature of the Mediterranean, Season, 1879–80.

Month	Mean Temperature	Highest Temperature	Lowest Temperature	Mean Temperature of Air	Sea Warmer than Air	Greatest Difference
	9 A.M.	9 A.M.	9 A.M.	9 A.M.	9 A.M.	9 A.M.
November .	60·2	63·2	58·8	52·6	7·6	19·6
December .	53 8	56·4	51·6	43·5	10·3	18·4
January. .	52·8	54·9	62·1	45·5	7·3	16·4
February .	53·8	55·0	52·2	50·0	3·8	6·7
March . .	55·2	56·2	52·1	55·0	·0	6·0
April . .	57·4	60·4	55 7	59·9	2·5[1]	8·8[2]
Mean . .	55·5	—	—	51·1	—	—

It thus appears that the mean temperature of the sea for the six months of the season 1879–80 was 55·5°; that the highest temperature which occurred in November was 63·2°, the lowest 51·6° in December, giving a difference of 11·6°. The mean temperature of the air at 9 A.M. was 51·1°, showing a difference of 4·4° for the whole season. Again, during the three coldest months, November, December, and January, the sea was relatively the warmest, the mean differences being 7·6°, 10·3°, and 7·3° respectively. In March the temperature of the sea corresponded, but in April the air was 2·5° warmer than the sea. On one occasion in November the difference in favour of the sea amounted to no less than 19·6°; in December to 18·4°, and in January to 16·4°. It thus appears that the sea is warmest just when warmth is most required, that is to say, during the coldest months of the winter season. Indeed, so warm is the sea at San Remo that there are but few days during the winter when bathing to a healthy Englishman would not be agreeable.

I have no record of the temperature of the sea at 3 P.M. during the winter season and none for the summer months. I know, however, that the temperature rises considerably on hot sunny days even in winter, while in the summer the readings would doubtless be very much higher than any which I have hitherto met with.

[1] In this month, the sea was 2·5° colder than the air.

[2] The air was on one occasion during this month 8·8° warmer than the sea at 9 A.M.

Temperature of the Mediterranean, Season 1880–81.

Month	Mean Temperature of Sea	Highest Temperature	Lowest Temperature	Mean Temperature of Air	Sea Warmer than Air	Greatest Difference
	9 A.M.	9 A.M.	9 A.M.	9 A.M.	9 A.M.	
November .	62·0	63·9	61·0	56·7	5·3	11·5
December .	59·8	61·0	59·0	52·2	7·6	9·9
January .	56·3	58·7	55·0	46·9	9·4	15·8
February .	54·0	55·7	52·6	50·7	3·3	5·1
March . .	55·4	56·6	53·8	55·2	·2	7·5
April . .	58·6	59·2	57·6	62·0	3·5[1]	—
Mean. . .	57·7	—	—	53·9	—	—

For the season 1880–81 the figures stand therefore thus: The mean temperature of the whole season was 57·7°, the highest point reached 63·9° in November, and the lowest 52·6° in February; showing a difference of 11·3° between the highest and the lowest points. The mean temperature of the air at 9 A.M. for the six months was 53·9°, giving a difference of only 3·8° on the whole season between the air and the sea. In this season again the greatest mean difference occurred in November, December, and January, and was for those months as follows: 5·3°, 7·6°, and 9·4°. In March there was but little difference between the sea and the air, but in April the air was 3·5° warmer than the sea. The greatest difference in November amounted to 11·5°, in December 9·9°, and in January to 15·8°.

It is thus again seen that the high temperature of the Mediterranean must exert a considerable effect in raising the temperature of the air, particularly at night and during the colder winter months.

The influence of the sea in warming the air is of course most felt near the shore, and houses near the sea are, when the air is calm, often warmer than those situated further from it. On the other hand, houses near the sea are more exposed to the sea breeze, while the land breeze descending from the mountains at night reaches first those habitations not specially protected by surrounding trees, which are furthest removed from the sea.

From the table for 1881–82, it appears that the mean temperature of the sea at 9 A.M. for the whole season was 57·5°, that the highest point reached was 62·5° in the month of November, and the lowest 54·3° in February, showing a difference of 8·2° between the highest and lowest points. The mean temperature of the air at 9 A.M. was 53·3°, giving a difference on the whole season of 4·2° between the air and the sea. During the two coldest months of the year, December and January, the mean

[1] *The air was 3·5° warmer in this month than the sea.*

difference in favour of the sea was 8·1° and 7·8°, and in March the sea was only 0·8° warmer than the air, while in April the air was 0·7° warmer than the sea. It thus again appears that it is during the two coldest winter months the sea is relatively the warmest; that is just when the air most requires to be warmed.

Temperature of the Mediterranean, Season 1881–82.

Month	Mean Temperature of Sea	Highest Temperature	Lowest Temperature	Mean Temperature of Air 9 A.M.	Sea Warmer than Air
November .	61·4	62·5	60·8	56·7	4·7
December .	57·9	60·6	55·8	49·8	8·1
January .	55·9	56·5	55·6	48·1	7·8
February .	55·1	56·0	54·3	50·8	4·3
March . .	56·4	59·0	55·8	55·6	0·8
April . .	58·2	59·4	57·3	58·9	0·7
Mean .	57·5	—	—	53·3	—

Captain Spratt ('Travels and Researches in Crete,' quoted by Dr. C. T. Williams) has shown that the Mediterranean in the Eastern and Western basins at a depth of 100 fathoms has a temperature of 59½° Fahr., whereas the temperature of the Atlantic at the same depth and latitude, according to the observations of Ross and others, is but 39½°, showing a difference of 20° between the two seas. The changes of temperature consequent on the seasons are said not to embrace more than a fall of 10° in winter and a rise from 10° to 20° in summer, and these changes extend only to the depth of 100 fathoms.

But the Mediterranean differs from other seas, not only in its remarkably high temperature, but in some other particulars, which, although less immediately connected with the subject of temperature, may here be referred to; as the greater concentration and weight of its water. Thus while the water of the Atlantic off Bayonne contains as much as 38 parts of saline matter in 1,000, according to Messrs. Legrange and Vogel, in that off Marseilles there is as much as 41 in 1,000 parts. The analyses of Messrs. Schweitzer and Laurent are nearly to the same effect; the water of the British Channel containing 35·2, and that of the Mediterranean 40·74 in 1,000 parts. This greater concentration of the water of the Mediterranean is mainly due to three causes: the small amount of water which this inland sea receives through the Straits of Gibraltar, the smallness of the rivers and streams which empty themselves into it, and the evaporation constantly going on, due in part to its own warmth, but mainly to the influence *of the sun*, mostly shining in a sky unobscured

by clouds. The intense blue colour of the Mediterranean has already been referred to, and it was partly explained by the dryness and clearness of the atmosphere allowing of the reflection in it of the bright blue sky; but the quantity of saline matter contained in it has been shown to be the principal cause of its depth of colour.

Comparative Humidity.

The subject of the Comparative Humidity of the climate of San Remo next claims attention; this comprises the relative humidity of the air, the number of days on which rain falls, the duration of the rain and the quantity, or rainfall.

The relative humidity, number of rainy days, duration of the rain, and the amount of the rainfall are influenced by a variety of circumstances, as the character of the surrounding country, the height of the protecting mountains, the distance these are from the town, and the direction of the prevailing winds. If there be mountains having an altitude of some 3,000 or 4,000 ft. close to the town, the probability is that the days of rain will be much more frequent than in places where they are further off. This circumstance, I believe, explains the great difference in the number of wet or partly wet days at San Remo and Mentone, although they are but fifteen miles apart; thus the average number of rainy days for the whole year at San Remo is forty-eight, while it is eighty at Mentone.

The subject of the winds at San Remo has already been considered, but it may be remembered it was stated that the northerly winds passing over the high mountain chains of Europe, become thereby deprived of their moisture, which is precipitated on the mountain tops in the form of snow, and hence when they reach San Remo they are particularly dry, and also cold winds. The north-east wind comes even from the arctic regions, the north-west wind passing over lower mountain chains is less dry than the north and north-east winds, but the latter, as also the east wind, are more moist and less irritating here than in England.

The southerly winds are both warm and moist in consequence of their passing over large tracts of water from the surface of which aqueous vapour is constantly being given off. It is therefore the southerly winds that usually bring rain.

Relative Humidity.

The amount of moisture contained in the air exerts a very marked effect on the character of the climate of any locality, and to this branch of the meteorology of health resorts too little

attention has hitherto been paid. Writers confine themselves frequently to the statement that a given place has a mean annual humidity of so many degrees, but this information is wholly inadequate, since two places may have the same relative humidity, and yet the condition of the two be entirely different. The relative humidity varies greatly even on the same day and from a variety of different causes, as from rain, mist, dew, wind, and sunshine; hence there should be a frequent record of the state of the air as regards humidity and its causes. As a rule, the morning air is somewhat damp and that of the afternoon much drier, but the evening air contains on an average more moisture than even the early morning air. This increased humidity may proceed from two different causes: it may be due to general humidity of the air from recent rain, but more frequently it proceeds from a deposition of dew after a dry sunny day with a cloudless sky at night. Now these two causes of humidity should be distinguished. The times during which the air is most damp are immediately preceding, during, and for some time after rain; during mist and fog; early in the morning, and in the evening from deposition of dew. The periods when the air is most dry are after prolonged drought, or with strong northerly winds prevailing and in bright sunshiny weather. I have often been struck with the little difference in the mean humidity of the air on many fine and sunshiny days, as contrasted with days on which the air or soil has been more or less moist from recent rain; the reason of this of course is that in the one case the morning and evening air is rendered humid by the falling dew, the air during the day being comparatively dry, while in the other there being no dew the air remains moist throughout both the day and night in consequence of recent rain. This difference is important from a health point of view, and deserves more attention than it has yet received.

The degree of moisture in the air is ascertained by means of two thermometers, the bulb of one being kept constantly moistened and the other dry. The drier the air the greater the difference of temperature indicated by the thermometers, the wet bulb thermometer of course showing, in consequence of the evaporation going on, a much lower temperature. The more moist the air the greater the approximation of the temperature indicated by the two bulbs, and the drier, the greater the difference. When the air contains as much moisture as it is capable of holding in suspension the two thermometers show the same temperature, and when this occurs the air is said to be 'saturated,' the point of saturation forming one end of the scale and being indicated by the figures 100. This condition of the air is not unfrequently observed during the course of a year.

The other end of the scale is distinguished by an 0, and this represents that the air is absolutely deprived of moisture, a condition never attained in temperate or habitable climates. The scale between the two extremes is divided into 100 degrees.

In order to convey a fair notion of the humidity of the air, this should be determined at least three times a day—morning, afternoon, and evening—and these observations should be reduced to daily, monthly, and annual means. In the following tables the monthly means of the morning, afternoon, and evening readings are shown for three winter seasons. It will be seen that the air in the afternoon is much drier than either in the morning or the evening, and that it is the least dry at the latter period.

RELATIVE HUMIDITY.

Month	9 A.M.	3 P.M.	9 P.M.	Monthly Mean
Season 1879–80.				
November . .	75·0	60·0	81·5	72·2
December . .	55·5	56·3	64·2	58·6
January . .	63·0	62·0	64·0	63·0
February . .	73·3	70·0	74·2	72·4
March . .	68·5	65·5	61·1	65·0
April . .	69·5	69·0	76·4	71·6
Mean of Season	67·5	63·8	70·3	67·2
Season 1880–81.				
November . .	72·5	70 5	78·2	73·7
December . .	74·7	70·0	76·1	73·6
January . .	78·3	70·7	70·6	73·2
February . .	68·6	63·4	74·2	68·7
March . .	74·7	72·0	82·0	76·2
April . .	68·0	65·0	79·8	70·9
Mean of Season	72·8	68·6	76·8	72·7
Season 1881–82.				
November . .	76·8	73·1	73·5	74·5
December . .	69·1	66·1	66·0	67·1
January . .	71·0	72·0	69·1	70·7
February . .	66·3	64·2	66·1	65·5
March . .	69·5	67·5	70·5	69·2
April . .	70·0	63·7	67·0	66·9
Mean of Season	70·4	67·7	68·7	68·9

From a comparison of these tables it appears that the first and last of the three seasons were relatively dry—that for the season 1880–81 being much more humid; the mean difference amounting in one case to 5·5°, and in the other to 3·8°.

The mean morning relative humidity for the three winter seasons was 70·2°; the afternoon mean, 66·7°; the mean evening humidity, 71·90°; the mean of the readings for the three seasons being 69·6°. Since invalids are scarcely ever out of doors either in the early morning or evening, it follows that they are most concerned to know the relative humidity of the air for the middle part of the day, and this is sufficiently shown in the afternoon readings recorded in the tables.

I notice that there is a very considerable difference between my observations as to the dryness of the atmosphere, and those taken at the Observatory of San Remo. According to the observations at the latter place the mean monthly humidity for the season 1879–80 was as follows: for November, 60·5°; December, 46·0°; January, 54·9°; February, 66·3°; March, 62·8°; April, 66·4°, the mean of the whole season being 59·5°, against my mean of 67·2°. This difference is to be explained partly, perhaps, by the instruments at the Observatory being high above any vegetation, namely, at an elevation of sixty-four feet. Now it has been found from experience that moist climates are as a rule sedative, and dry ones stimulating. A very important practical distinction.

It may here be asked to which of these two divisions does the climate of San Remo belong; the answer is that it is moderately dry and stimulating, but less so than some of the other health resorts of the Western Riviera. This difference arises in part, as already explained, from the very abundant vegetation in and about San Remo and the more retentive soil.

The greater or less dryness of the air of rooms occupied by invalids, especially those suffering from bronchitis and asthma, is a matter of much importance; the air may be either too dry or too moist; so that it is very advisable that the condition of the air of rooms as regards the relative humidity should be frequently observed by means of the combined wet and dry bulb thermometers.

The Rain.

The rain on the shores of the Western Riviera falls chiefly at two periods of the year: namely, at the autumnal and vernal equinoxes. The autumn rainfall usually begins near the end of September, continues at intervals through October, and may if later than usual extend even into November; the spring rainfall commences generally in March, and may include the early

part of April, but the exact time of the commencement and termination of the equinoctial rains varies in different years.

The autumn equinox being over, there is usually a lengthened period of dry weather, with a prevalence of northerly winds; the spring equinox ended, a still longer dry period of from five to even six months is sometimes experienced. The great dryness of the summer on the shores of the Mediterranean is due to the fact that this sea is placed near the northern limit of what is known as 'the rainless tract,' which comprises the desert of Sahara.

This dryness renders the storage of water in large tanks and frequent irrigation, usually by means of innumerable water channels, which on low-lying grounds one sees everywhere, absolutely indispensable to the preservation of the Orange, Lemon, and many other trees and vegetable productions.

When rain comes with a northerly wind it is usually gentle, but when with a southerly it often descends with almost tropical violence, as much as over seven inches of rain having been known to fall in a single day. On November 28, 1881, 7·26 inches fell in the course of a few hours, carrying away bridges and doing much damage. When such tropical rain falls on the mountains, the beds of the torrents and rivers become suddenly filled with large volumes of water; this rushes impetuously to the sea, carrying with it great quantities of earth, stones, pieces of rock, and all kinds of *débris*. Very quickly, however, the rivers recover their usual and comparatively insignificant proportions, and their wide, stony, and unsightly-looking beds are once more exposed to view. Those who are not acquainted with the effects of a sudden and heavy rainfall often wonder at the insignificance of most of the rivers in the Riviera, in comparison with the size of their beds, which seem far wider than could ever be required. This is observed particularly with the Paillon at Nice and the Roya at Ventimiglia.

This heavy downpour takes place especially at the point where the south and north winds meet; sometimes, as Dr. Bennet has so well shown, this happens at the top of the mountain ranges, at others it occurs a little way out at sea—the weather on the shore line remaining bright and fine all the time.

The number of days on which rain falls, and the amount of the rainfall, vary in different parts of the Western Riviera; this variation being mainly determined by the height, form, and arrangement of the contiguous and protecting mountains.

At San Remo, according to Dr. Onetti, there are but forty-five days in the year on which rain falls, but he does not give the data upon which this average is based. In reply to my inquiries,

Signor Rodi, of the Observatory at San Remo, has furnished me with the particulars embodied in the subjoined table :—

Years	Days in Year	Days in Winter Season	Hours in Year	Annual Amount
				inches
1866	63	35	225·50	43·30
1867	61	36	181·30	23·36
1868	55	29	172·50	26·19
1869	35	27	—	16·18
1871	43	22	110·30	20·43
1872	61	44	336·00	57·08
1873	45	45	161·45	31·92
1874	39	20	169·45	20·20
1875	35	25	—	18·79
1877	43	33	208·50	30·42
Means . .	48	31·6	195·6	28·7

From the preceding table it appears that during the 10 years, rain fell on an average on 48 days in each year, that the period during which rain actually fell amounted to no more than 195·6 hours for the whole year, or a little over 8 days and nights, and lastly, that the rainfall was 28·7 inches.

The meteorological observations taken at the Observatory for 1878 and the first half of 1879 were so incomplete that I have not included them in the above table : this is much to be regretted, as the weather during the greater part of that period was so exceptional, especially as regards the number of rainy days and the rainfall, and to a less extent the temperature, that the observations would have affected the averages, not only for San Remo, but for the whole of the Western Riviera. Turning to my own observations I find that rain fell during the winter season of 1878–79, commencing November 1, on no less than 74 days ; it should be stated, however, that the day included the whole 24 hours, and hence on some of the days enumerated rain fell only in the night. The amount of the rainfall was also excessive.

But since the winter season at San Remo extends from November 1 to April 30, it became important to determine the average number of days on which rain fell during that period, and I found it to be for the ten years 31·6 days. I have during the last four winter seasons taken a very careful series of observations of the rain and rainfall, and I will now proceed to give the results. The principal particulars in relation to these points for the season 1879–80 are set forth in the following table :—

Rain and Humidity, Season 1879–80.

Month	Days of Day Rain	Hours of Day Rain	Rainfall	Mean Relative Humidity	Highest Humidity	Lowest Humidity	
		h. m.	inches				
November .	6	31·30	2·40	65·6	94·4	44·2	Strong N.W., W., and N.E. winds
December .	3	20·00	1·65	58·7	93·1	33·3	Strong N.E. wind
January . .	1	·10	·08	63·2	84·6	44·2	Strong N.E. wind
February .	5	27·00	2·70	74·0	95·8	53·0	
March . .	3	3·00	·20	75·0	85·9	47·7	Strong N.E. wind
April . .	9	35·30	3·30	70·6	84·6	50·6	S.E. gale
Total . .	27	117·10	10·26	67·8	—	—	—

Observations.—When only a few drops of rain fell, and the quantity was too small to be measured, they were not included. There were three days in November and three in February when this occurred. The figures of the rainfall in the above table are calculated from the register of the Observatory at San Remo.

It thus appears that there were but 27 days on which a measurable quantity of rain fell; that the period during which it actually descended embraced only 117 hours, between 9 A.M. and 9 P.M.; and that the total rainfall amounted to 10·26 inches.

The facts for the season 1880–81 are as follow :—

Month	Days of Day Rain	Hours of Day Rain	Total Rainfall	Mean Relative Humidity	Highest Humidity	Lowest Humidity	
		h. m.	inches				
November .	7	32·30	4·00	74·6	91·2	55·4	Strong S.W. and W. winds
December .	2	1·05	0·28	72·6	92·3	49·0	—
January .	12	55·25	6·54	73·3	94·5	37·4	Strong N.E. wind
February .	7	30·30	1·44	68·4	88·2	48·2	—
March . .	5	18·45	1·25	76·0	94·4	54·8	—
April . .	10	22·50	1·76	70·7	86·4	53·4	Strong E. wind
Total .	43	161·05	15·27	Mean 72·8	—	—	—

It is shown in the above table that rain fell on 43 days, and, including the nights as well as the days, on no less than 49 days of 24 hours each. This is a very high average for San Remo, seeing that the mean number of rainy days for the whole year amounts to only 48·0. But the rain was all needed to make *up for previous* deficiencies. The number of hours of *day* rain

only for the six months was 161·0; the total rainfall, including the nights, amounted to 15·27 inches—the average for the whole year being 28·78 inches.

With respect to the number of rainy days, it should be stated, that on 13 of the 49 days and nights the rainfall did not exceed 0·05 of an inch, and in four instances it amounted to only 0·01, the least quantity measurable. These figures show that the winter season of 1880–81 was for San Remo unusually wet, though as contrasted with England and many other countries, it would still have to be regarded as a very dry one.

Rain and Humidity, Season 1881–82.

Month	Days of Day Rain	Days of Rain	Hours of Day Rain	Total Rainfall	Mean 9 A.M.	Relative 3 P.M.	Humidity 9 P.M.	Mean Monthly Humidity	Highest Humidity 3 Readings	Lowest Humidity 3 Readings
November .	4	5	28·00	9·47	76·8	73·1	73·5	74·5	95·8[1]	55·8
December .	6	7	19·10	1·47	69·1	66·1	66·0	67·1	84·8	46·7
January .	2	4	19·00	1·42	71·0	72·0	69·1	70·7	85·8	55·8
February .	1	1	1·30	0·82	66·3	64·2	66·1	65·5	86·0	42·4
March . .	3	5	6·15	2·11	69·5	67·5	70·5	69·2	92·0[2]	45·8
April . .	2	5	7·00	1·35	70·0	63·7	67·0	66·9	85·0	40·6[3]
Total. .	18	27	80·55	16·64	70·4	67·7	68·0	68·7	88·2	47·8

It is shown in the above table, amongst other particulars, that during the whole six months rain fell in the daytime only on 18 occasions, and 27 times, including the nights as well as days; the hours during which the day rain actually descended were but 81, the total rainfall for the whole season being 16·64 inches.

The figures quoted prove that the winter season of 1881–82 at San Remo was a very favourable one as respects rain and moisture; the air, although comparatively dry, was not so to the extent of its becoming overstimulating and exciting. Of the 16 inches of rain, no less than 7·26 inches fell in the course of twenty-four hours, doing much damage.

It has been pointed out that the principal rainfalls occur at two periods; usually in September and early in October, and in March and the first part of April. Now, the invalids who come to the Riviera in search of health, do not generally arrive until after the termination of the autumnal equinox, so that they

[1] The unprecedented quantity of 7·26 inches fell in 24 hours between 9 A.M. on November 28 and the same hours of the following morning, doing much damage.

[2] A sea fog, a very rare occurrence.

[3] Strong N.E. wind.

usually escape this first great rainfall, and have only to encounter the second period, that of the vernal equinox.

Contrast for a moment the preceding figures with the number of rainy days in some other health resorts, especially the most favoured places in England. It appears that during the years 1876, '77, and '78 rain fell in Ventnor on no less than 524 days, giving an average of 174·6 days for each year; also that taking the six months' winter season, beginning November 1, for the two seasons 1876–77 and 1877–78, rain fell on 210 days, making an average of 105 days each season. At Bournemouth in the course of 10 years, commencing with 1866 and ending December 1878, the years 1872, '75 and '77 not being given, in consequence of the incompleteness of the observations, rain fell on 1,563 days, showing an average of 156·3 for each year, and in the winter seasons it fell on 967 days, making an average of 87·9 for each season. Lastly, at Torquay (Babbacombe), during the years 1877 and 1878 rain fell on 400 days, giving an average of 200 days for each of these years.

The following table comprises the annual number of rainy days, and the amount of the rainfall, at some of the principal winter health resorts of Europe:—

	Days		Inches
San Remo	48		28·78
Mentone	80	De Brea	23·68[1]
Nice	70	De Valcourt	25
	60	Roubaudi	
Cannes	70	„	35·43
Hyères	63	„	27
Pau	119		43
Malaga	40	Francis	16·50
Madeira	88	White	30
Ventnor	174·6		34·54
Bournemouth	156·3		28·81
Torquay	200		39·66

'The mean number of days on which rain falls in London is 89·5 (Strachan), or just about twice as many as at Cannes during the corresponding winter months; but while the amount of rainfall at Cannes is 20·3 inches, in London it equals 10·8, or about half.' (Marcet.)

Such, then, are the principal data on which a reliable and scientific estimate of the climate of San Remo may be based. To sum up briefly, the particulars, so far as the six months' winter season is concerned, stand thus:—

The mean season north shade day temperature is 53·1, or from eight to ten degrees higher than that of England.

[1] For six months only.

The mean maximum north shade temperature 58·7° Fahr.

The mean minimum or night temperature for the season is 46·2° Fahr.

The mean variation of the day shade temperature is 5·8°, the greatest day difference recorded being but 14° Fahr.

The mean sun-heat, as estimated by the naked black bulb solar thermometer, is 72·4° Fahr.

The mean sun-heat indicated by the vacuum solar radiation thermometer is 118·7° Fahr.

The mean duration of the sunshine equals 7·8 hours per day, not including the few sunless days.

The days on which the sun shines amount on an average to 162 out of the 181 days of the season, leaving only twenty days each season without sun.

The mean relative humidity for the whole day is 69·6°; but that at 3 o'clock P.M. is only 66·7°.

The mean number of days on which rain falls is 30, and the mean rainfall 14·06 inches for the whole season.

With respect to temperature the data show that the climate of San Remo, and the same may be said of the Riviera generally, so far from being, as it is often described, so warm as to be relaxing, is really during nearly the whole of the winter season cool and bracing, sometimes even cold; even in summer it is not unduly hot, the mean temperature for June being 69·17, for July 74·33, and for August 73·85. Many people indeed complain of the coolness of the climate in the winter, and certain it is that the same clothes should be worn here as in England; it is only in April that any change should be made, and then with great caution.

The data show that even at night the temperature but seldom falls below 40°, and this only out of doors and in the coldest months, which are usually December and January—that the temperature of the air but rarely falls to the freezing point, often not once in a whole winter season, though a thermometer placed on the ground does occasionally descend to or below that point. Frost is therefore rare; snow seldom falls in the precincts of the town, although in some winters it may be seen above the olive-clad hills on the surrounding mountains.

The range of day shade temperature is exceedingly small, and this is an important point in favour of the climate of any place.

Let us now contrast the data for London with those given above. They bring out in a striking manner the great difference in every particular between the climate of the two places. The readings of the vacuum solar radiation thermometer on the grass will be relatively higher than those of an instrument suspended in the air four feet above the ground, as my thermometer was placed.

Observations for London, Season 1881–82.

London	Mean North Shade Temperature	Mean Minimum Temperature	Mean Maximum Temperature	Mean Sun-heat with Self-Registering Thermometer with Blackened Bulb *in vacuo*, on grass	Number of Days on which Sun shone	Number of Hours of Sunshine	Number of Days on which Rain fell	Rainfall In Inches	Degree of Humidity as Compared with 100, which represents Complete Saturation
1880									
Week ending November 6	39·3	31·2	47·2	73·0	4	24·2	0	0·	83
" " 13	46·3	40·2	51·5	69·5	4	7·8	4	0·24	84
" " 20	40·8	36·3	46·9	65·3	4	8·1	5	1·38	88
" " 27	42·4	36·4	48·0	66·4	6	16·8	5	0·46	82
" December 4	44·1	37·5	49·3	60·6	3	4·4	1	0·04	89
" " 11	47·7	43·4	51·2	59·5	3	5·2	0	0·	87
" " 18	43·3	38·1	47·7	55·5	2	3·5	5	0·76	86
" " 25	40·6	34·9	45·7	55·9	4	9·4	4	1·26	87
1881									
Week ending January 1	40·6	35·8	44·7	53·3	3	1·1	5	0·96	91
" " 8	38·4	34·9	41·8	57·8	4	13·5	0	0·	86
" " 15	28·0	24·0	31·6	43·2	3	3·8	1	0·13	83
" " 22	23·4	18·5	28·9	43·5	2	6·9	2	0·46	81
" " 29	32·5	27·9	37·9	51·0	1	2·1	4	0·49	92
" February 5	42·8	38·5	47·8	64·9	3	6·3	7	0·22	92
" " 12	38·8	33·8	45·1	73·3	6	15·1	5	0·77	83
" " 19	38·0	33·7	42·7	54·4	1	0·2	3	0·51	92
" " 26	34·4	30·9	38·1	57·2	2	6·9	4	1·00	89
" March 5	37·1	32·2	43·4	72·4	4	9·0	3	1·20	83
" " 12	49·4	44·3	56·0	89·4	5	16·4	3	0·26	83
" " 19	44·8	36·0	55·5	98·0	7	38·8	0	0·	81
" " 26	39·5	33·1	47·5	82·2	7	14·0	6	0·39	80
" April 2	39·1	29·6	49·2	104·7	7	55·7	0	0·	70
" " 9	40·5	32·1	49·6	110·9	7	49·1	0	0·	72
" " 16	50·8	41·8	61·7	112·1	7	17·0	2	0·15	81
" " 23	43·5	34·8	53·4	96·0	6	28·7	2	0·11	69
" " 30	49·9	42·1	59·2	101·7	6	16·3	4	0·36	75
	40·6	34·7	47·0	72·0	111	385·3	75	11·15	83·4
	Mean of 6 months				Total			Mean of 6 months	

Turning again to my own observations, the figures given of the mean sun-heat by the ordinary sun thermometer prove that the sun shines with considerable power in San Remo, and not only so, but that there are but few days in the six months' winter season on which it does not shine on an average for several hours a day.

The mean difference between the shade temperature and the *sun*-heat, as indicated by the ordinary black bulb solar ther*mometer, is* in round numbers about 20° ; this difference is con-

siderable, and it shows that the warmth of the climate of the Riviera is to a great extent sun-warmth, and it explains sufficiently why on suddenly passing from the sun into the shade a feeling of chilliness is so quickly experienced.

The mean difference between the north shade temperature and the sun-heat as recorded by the vacuum solar thermometer is of course still more considerable, it amounting to no less than 60·7° Fahr., but it has already been explained (page 64) that the human body is never under any natural circumstances exposed to the high degrees of heat indicated by that instrument. But to this subject I shall shortly have occasion again to refer.

The mean relative humidity of San Remo is indicative of a climate of moderate dryness only, of a climate, in fact, less dry than that of some other parts of the Western Riviera. This is due to, and is explained by, two circumstances already noticed, the one being the large amount of vegetation in and around San Remo, the mountain tops being for the most part covered with forests of pine trees, and the other that the soil of San Remo contains a considerable admixture of clay; this retains the moisture near the surface, parting with it slowly by evaporation, and thus preventing the air from becoming as dry as otherwise it would be at times. The effect of this admixture of clay in the case of a naturally dry climate like San Remo is therefore rather beneficial than hurtful. It is thus that the climate of San Remo is rendered more sedative than that of some of the other towns of the Riviera. As a consequence, but few persons who come here suffer from sleeplessness, a very frequent complaint at Nice and even at Cannes, near the sea.

With reference to the relative humidity, the effects of the sun's heat should not be forgotten; this causes much of the moisture on and near the surface of the ground to become evaporated and to pass into the air, but with the withdrawal of the sun's rays at sunset this moisture is reprecipitated in part on the earth in the form of dew. It is this deposition of dew which causes the morning and evening readings of the wet and dry bulb thermometer to be so much greater than they would be otherwise, and hence it follows that the mean humidity of the mid-day or afternoon reading is that which best indicates the character of the climate as respects its relative humidity.

The comparative dryness of the climate is still further established by the small number of days and hours on which rain falls, and the very moderate amount of the rainfall.

It has been stated that a considerable fall of temperature takes place at sunset on the days the sun shines, and, not only so, but that when the sky is clear and bright a deposition of moisture or dew also occurs, rendering the air while it falls more

or less humid. It is for these reasons that delicate people are always advised never to be out at or shortly after sunset; in fact they should be within doors some time before sunset.

FALL OF TEMPERATURE AT SUNSET.

December 9.

h. m.		Temp.		R.H.
3·00	Somewhat cloudy	60·0	5·2	70·4
4·00	"	55·8	3·8	76·4
4·30	"	52·4	2·5	83·0
(sunset)				
5·10	Clear	51·3	2·2	84·8
5·40	"	49·8	2·2	84·8
6·00	"	49·8	2·0	86·0
9·00	"	50·4	2·0	86·7

December 10.

3·00	Bright	62·3	4·9	72·5
4·00	"	60·0	4·2	75·0
4·32	"	52·9	2·1	86·2
(sunset)				
5·00	"	52·5	3·1	79·4
5·30	"	52·3	4·8	70·0
6·00	"	51·5	5·0	69·0
9·00	—	53·4	3·2	81·2

December 11.

3·00	Bright	60·0	—	—
4·00	"	55·3	4·1	75·2
4·34	"	54·7	3·0	80·0
(sunset)				
5·00	"	52·8	2·9	81·3
5·30	"	51·0	2·5	83·0
6·00	—	50·5	3·2	78·8
9·00	—	52·4	3·8	75·6

December 12.

3·00	Sunshine and cloud	61·0	5·0	71·0
4·00	Rather cloudy	59·9	4·3	74·5
4·34	"	56·3	3·0	81·0
(sunset)				
5·00	Cloudy	53·2	2·0	86·0
5·30	"	52·9	2·2	84·8
6·00	Moonlight	53·0	2·3	84·6
9·00	"	51·9	3·4	77·6

December 14.

h. m.		Temp.		R.H.
3·00	Bright	60·4	5·6	68·0
4·00	"	60·2	6·2	65·2
4·35	"	55·3	4·2	74·0
(sunset)				
5·00	"	52·2	2·9	81·0
5·30	"	50·0	2·0	86·0
6·00	"	49·7	2·3	84·8
9·00	"	49·5	2·6	82·2

December 15.

3·00	Sunny	60·8	6·3	64·8
4·00	Sun and cloud	54·9	3·8	75·2
4·36	Pretty clear	52·0	2·7	82·0
(sunset)				
5·00	Cloudy in west	51·0	2·5	83·0
5·30	"	50·6	2·7	81·8
6·00	Bright	51·0	2·6	82·4
9·00	"	51·0	2·7	81·8

December 16.

3·0	Sun partly obscured	60·8	4·9	71·5
4·00	Sun obscured, overcast	57·7	5·5	68·1
4·37	"	57·4	5·0	70·7
(sunset)				
5·00	Obscured, except in west	57·3	4·9	71·2
5·30	Cloudy	57·4	4·0	75·0
6·00	"	57·6	4·0	75·6
9·00	—	56·6	5·5	67·8

December 17.

3·00	Bright	59·8	5·3	69·5
4·00	Overcast	56·7	4·5	72·9
4·40	"	54·8	3·1	79·4
(sunset)				
5·00	"	54·4	3·7	75 8
5·00	"	54·2	3·2	80·6
6·00	Clearing a little	53·0	3·0	79·4
9·00	—	—	—	—

The columns of figures in the above table indicate in order, the time, temperature, difference between the wet and dry bulb *thermometers*, and the relative humidity.

The effect of sunset on the temperature and humidity are well exhibited in the table, taken from my paper on the 'Climate of San Remo,' read at the annual meeting of the British Medical Association in 1881. It will be noticed that the greatest fall of temperature takes place when the sky is clear and free from cloud; it is then also that the dew falls and the air becomes most moist. On cloudy days the fall of temperature is much less and the air much drier.

Difference of Shade Temperature and Sun-heat.

It has been already shown that the mean daily range of north shade temperature is very small; that of the sun-heat is of course more considerable in most climates, and the difference between the two is still greater. With a view to elucidate this point I cannot do better than reproduce in this place the substance of a paper communicated by me to the 'International Medical Congress,' and published in Volume II. of the 'Transactions' of the Congress.

The first chapter of the recent and very excellent work by the late Dr. Sparks on the Riviera is devoted to a description of the meteorology of that famous district. On page 2 of that chapter are the following remarks:—

'According to Teysseire, the mean temperature for the winter of spots exposed to full sunshine is 128·9° Fahr., and of those in the shade on a northern wall 55·9° Fahr.; giving a difference between the two of 73°.

'In spring the numbers are 146·1° in the sun, and 67·6° in the shade; difference 78·5°.

'In summer we have 155·1° in the sun, and 82·9° in the shade; difference 72°.

'In the autumn the temperatures are 139·8° in the sun, and 64·4° in the shade; difference 75·20°.

'The mean difference for the whole year is thus 75·2°.'

Referring to M. Teysseire's own figures, which are given in accordance with the Centigrade scale, I find that when converted into that of Fahrenheit, they differ slightly from the above and stand thus: Difference in winter, 74·5°; in spring 78·5°; in summer 74·0°; and in autumn, 75·2°; the mean difference being 75·5°.

I was much surprised at these results, and, seeing the importance of the subject, I resolved, on the first convenient occasion, to put the figures given above to the test; and I have therefore made some special observations, with a view to the determination of the range of difference between the sun and

north shade temperatures. If the figures quoted are correct, and there be really anything approaching a mean annual difference of 75·2° Fahr. of spots exposed to the full sunshine, and the shade of a northern wall, then the climate of the Riviera must be most trying, not to say, in many cases, highly dangerous.

Dr. Sparks has not stated in what position the sun thermometer was placed, or with what kind of instrument the temperature of spots exposed to full sunshine was taken, an omission of some importance, as will presently appear. M. Teysseire himself thus describes in 'Vingt ans d'Etudes Météorologiques à Nice,' the circumstances under which the figures were arrived at: 'On est frappé dans ce pays plus encore en hiver qu'en été de la forte chaleur que l'on ressent lorsqu'on est exposé aux rayons directs du soleil . . . pour donner une idée précise de l'énorme différence de température que l'on éprouve en passant du soleil à l'ombre, et réciproquement, je vais rapporter ici les observations comparatives que j'ai faites pendant un an (1868). J'ai placé, plusieurs fois dans chaque mois, de midi à deux heures, sur le bord de ma fenêtre et en plein soleil, un thermomètre à mercure, dont j'avais préalablement enveloppé la boule d'un tissu de laine noire, afin d'éliminer l'effet du rayonnement et d'empêcher la dispersion du calorique; ce thermomètre se trouvait donc dans les mêmes conditions qu'une personne vêtue de drap noir; j'ai noté avec soin les indications de cet instrument et celles que me donnait, au même instant, mon thermomètre placé au nord et à l'ombre.' It will be observed that M. Teysseire states he placed his thermometer several times in each month in his window in full sunshine; and in a note addressed to myself, he further remarks that the instrument was so placed only on days that were entirely free from cloud. Hence it appears that his mean temperatures are not founded on a continuous series of daily observations, as they should have been, in order to arrive at a true season and annual mean. M. Teysseire's figures, therefore, accepting them for the moment as correct, indicate the extreme differences between sun and north shade temperatures rather than the mean differences.

With a view to test the temperature given by M. Teysseire, I prepared a thermometer in the manner described by him, enveloping the bulb with a piece of black cloth of sufficient substance for a moderately heavy great-coat, and I placed it in a horizontal position over grass some inches from the ground, and away from houses or other objects which could be sources of reflected heat. I placed near to the clothed thermometer three other thermometers for comparative observations; an ordinary maximum thermometer, a black bulb solar radiation, and a *vacuum* solar radiation thermometer. Observations were taken

on fifty-nine different days, mostly consecutive, extending over the months of February, March, and April, and I will now proceed to summarise the results.

The observations with the maximum thermometer gave a mean temperature of 72·9° on thirty days. Those with the ordinary solar radiation thermometer, a mean of 76·2° on fifty days, and those with the thermometer clothed in cloth for the same days, a mean of 82·6°, or 6·4° higher than the mean of the readings of the ordinary solar radiation thermometer. The results of the readings of the vacuum solar radiation thermometer will be stated later on.

Now, the mean maximum north shade temperature for the same dates and period was 60·5°, showing a difference of only 22·1° between the sun-heat as recorded by the thermometer clothed with cloth, and the maximum north shade temperature in place of a mean annual difference of 75·5° as given by M. Teysseire. But the figures may be put in a still more striking form. In place of taking the mean of all the observations, I will give that of the six days in each of the three months, which showed the highest readings with the clothed thermometer, namely, 85·7°, and the north shade temperature for the same eighteen days was 62·0°, giving a difference of only 23·7°.

The greatest difference, which occurred in February, was 38·2° on the 11th; in March 23·0° on the 27th; and in April 35·6° on the 29th. If in place of taking the mean maximum north shade temperature, 60·5°, we take the minimum north shade, 48·2°, which of course occurs almost invariably at night, and therefore is not a temperature to which the human body is subjected under ordinary circumstances, the mean difference between the readings of the minimum thermometer and the sun-heat, as shown by the thermometer clothed with cloth, will even then amount to only 34·4°. But M. Teysseire made no such comparison as this, his north shade readings corresponding exactly as to date and time with those of his sun thermometer.

Thinking it possible that by clothing the thermometer still more I might obtain higher readings, approximating even to those of M. Teysseire, I placed around the bulb three coverings, the first of flannel, the second of linen, and the third of cloth, in imitation of the clothing of most individuals when out of doors. This thermometer was exposed to the sun for three consecutive days in May and the same number in June. The mean temperature with this clothed thermometer was 102·3°, while the mean maximum north shade temperature for the same days was 76·3°, showing a difference of 26·0° only, in place of 75·5° as given by M. Teysseire. The mean of the readings of the ordinary solar radiation thermometer for the same days was 91·3°, or 11·0°

less than that of the clothed thermometer. That the thermometer prepared as described should indicate a higher temperature than even the solar radiation thermometer is only what might have been anticipated, seeing that the bulb of the former is protected to a considerable extent from the action of currents of air and moisture, but still, as will be seen, the readings fall very far below those by M. Teysseire. The indications furnished by the clothed thermometer, especially that with the triple covering in imitation of the ordinary clothing of man, are really of considerable practical interest and importance, as they demonstrate the actual temperature to which the human body when thus clothed is subjected. It is not a difficult matter to prepare thermometers in the manner described.

Had M. Teysseire's readings been obtained with the vacuum solar radiation thermometer, the results would not have been so surprising, and they would have stood somewhat thus: The mean sun-heat as recorded by me at San Remo by means of the vacuum solar radiation thermometer for five months of the winter season of 1879–80 was 119·72°; and the mean maximum north shade temperature for the same months was 57·3°, showing a difference between the two of 62·4°; again, the mean sun-heat for the following season, 1880–81, was 121·6°; and the mean maximum north shade temperature for the same period was 62·5°, giving a difference of 59·1°; the mean difference of both series of observations being 60·7°. It thus appears that even the readings of the vacuum solar radiation thermometer do not reach by some degrees those of M. Teysseire; but if they did, the indications of the clothed thermometer are not comparable with those of the vacuum solar thermometer. M. Teysseire expressly states that his thermometer resembled a person dressed in black, implying thereby that a person thus clothed would be subjected under like circumstances to the temperature indicated by that instrument; but in the case of the vacuum solar radiation thermometer the circumstances are totally different; the bulb is *in vacuo*, and of course protected from the influence of the moisture and currents of air; its readings therefore are necessarily very much higher, and they do not at all indicate the temperature to which the human body is exposed under natural conditions.

The sun doubtless possesses very great power in the Riviera, and this is one of the advantages of the climate; there is certainly considerable difference between sun and shade, but even in England and other colder climates there is much difference, although to a less extent, between the temperature in the shade and that in the sun. Apart from the increase of temperature occasioned by the power of the sun, the temperature of the climate of

the Riviera is a very equal one. In the six months' season of 1879–80 the greatest range of temperature which occurred, and this once only, was 14°, and the mean for the whole season was only 6·3°. The figures for the winter season of 1880–81 were almost identical, the mean being 5·7°.

The preceding observations, although they do not extend over the whole year, are yet amply sufficient to show that the figures given by M. Teysseire cannot be accepted as correct, and that the range of difference of temperature between sun-heat and north shade is less than one-third of the range given by that gentleman. The great difference between my observations and those of M. Teysseire appears to be explained by the position in which his thermometer was placed, namely, as he says, 'sur le bord de ma fenêtre,' where, doubtless, it was much affected by radiation. It should be stated, however, that M. Teysseire is a very careful observer, and that he has taken a very extensive series of meteorological observations at Nice for a period of over thirty years. Although my observations were taken at San Remo and his at Nice, yet this really makes no practical difference in the general accuracy of the conclusion at which I have arrived.

Considering the importance of the health resorts of the Riviera, and the annually increasing number of invalids and others who frequent them, it was very necessary that an error of such magnitude as the one indicated, and to which such prominence has been given, should be challenged and rectified.

Since the date when the paper of which the above is an abstract was published, it has occurred to me that this question might be more accurately determined simply by a comparison of the mean north shade temperature for a series of years with that of the sun-heat as recorded by the ordinary black bulb thermometer. The difference between these means as already shown is only about 20°, in place of 75°, or little more than one-fourth of the range of M. Teysseire, quoted by Dr. Sparks and other medical writers.

To sum up then in a sentence the chief characteristics of the climate of the Riviera, of which San Remo may be taken as one of the best types, one would say of it that during the six months' winter season the weather as a rule is dry, mild, bracing, and sometimes windy and even cold; also bright and sunny, with a brilliant blue sky and sea. In the summer it is even more dry, but still fresh; of course very warm, though rarely excessively hot and never close and sultry, with a still more brilliant sunshine and an even brighter sky and sea.

It must not be imagined, however, that winter is not experienced in the Western Riviera, only it sets in later, terminates earlier, and is rarely severe, the utmost inclemency experienced being the

very occasional and temporary presence of slight frost, with sometimes snow on the higher mountains. In most winters it does not freeze at all in the more sheltered parts below the mountains or on the shore level.

The cold is, however, sufficiently great to make fires usually necessary at least during three out of the six months of the season, especially on cloudy, wet, and sunless days, and also in the evenings; on such occasions the fire should not be spared, although it is somewhat expensive. The fuel consists almost entirely of the wood of the Olive tree, and the heat given out is not nearly equal to that of a good English coal fire; still if the wood fire be well kept up, it gives a fair amount of warmth and is free from the objectionable sulphur compounds generated by the combustion of coal, and hence it does not vitiate the air of the rooms to the same extent. The fires are lighted at San Remo and other places on the Riviera with fir cones, which are collected from the fir forests of the higher mountains in large quantities; it is sufficient simply to apply a match to them and they at once burst into a flame, owing to the large quantity of resin they contain; these cones constitute the most elegant, fragrant, and effective of fire-kindlers.

The opinions of various writers, chiefly medical, relative to the climate of San Remo may now be cited, most of these, by a residence there, having had ample opportunities of arriving at correct conclusions.

Mr. Aspinall has thus recorded the opinion entertained by him:—

'San Remo has a delightful climate, so fresh and bracing and yet so balmy; there is even a certain amount of humidity in the air, especially at the east end of the town, which suits some invalids better than too dry an atmosphere. As far as my own experience goes I have not found any other climate from which I have derived so much benefit, though I have passed a winter in Madeira, another in Egypt, and shorter periods in Rome, Naples, and Sorrento. It combines in a modified degree the invigorating qualities of Nice with the warmth of Mentone, but without its closeness. There must be something peculiarly soothing and conducive to sleep in the air of San Remo; at Nice sleeplessness was a general complaint, and I, amongst others, suffered dreadfully. Here on the contrary I scarcely pass a sleepless night, and I find it has the same effect almost universally.' 'Another way in which nature has been wonderfully and specially kind to San Remo is in protecting it almost as well from the heat of summer as from the cold of winter; the sun rises out of the sea in mid-winter, but as the summer advances its gradual progress towards *the north brings it* behind the mountains, the natural consequence

of which is, that it rises about an hour and a half later in San Remo than in the more level country, and also rises later there in April than in February; the same applies to its setting, so that there are actually two or three hours less of the sun's heat in the day. This also makes the twilight very long and peculiarly delightful and cool.'

The late Dr. Rose, who lived and practised for some years at San Remo, where he was for a time Vice-Consul, in a pamphlet entitled 'Climate and Phthisis,' has thus written: 'Its climate is intermediate between the east and west ends of Mentone, not so warm as the former, and more sheltered than the latter, the air being also more soothing than at Cannes, Nice, and Mentone. This depends on the fact that the ground is covered to the water's edge with Orange, Lemon, and Olive trees, thus preventing too rapid evaporation, and the soil, being principally clay, prevents the rain percolating through so rapidly as it would in sandy and gravelly soil.'

Dr. Prosser James, in his brochure on the 'Climate of San Remo and other Winter Stations of the Mediterranean,' has discussed and considered fully the merits of San Remo as a winter station. He writes: 'Protection from injurious winds is then the chief characteristic of the climate. At the same time, as a very large space is encircled by these hills, there is never that stifling feeling, produced by want of ventilation, which is such a drawback to those resorts which are built immediately under protecting or overhanging cliffs. Even when all is calm below, strong winds may sweep freely over the town and agitate the sea beyond the precincts of the bay.'

Further on, Dr. James thus expresses himself: 'San Remo then, with its warmer and more equable temperature, its calmer atmosphere, its tone-giving elasticity, its dryness and other attractions, must be preferable to any of the other stations in certain cases. These are for the most part those for which other localities are too stimulant.'

'We hold,' writes Dr. Onetti, 'San Remo, e il suo Clima,' 'as very rare the climates which maintain an equal temperature and which show extremely slight oscillations, as that of San Remo: warm in winter, cool in summer, and delicious in spring and autumn.'

Another medical writer who was for a time at San Remo, and afterwards at Nice, Dr. Pasquale, wrote: 'San Remo has a most beautiful and picturesque situation, the most sheltered, mild, and healthy spot that can be found on the Mediterranean coast.'

Dr. Sigmund, a distinguished physician of Vienna, in his 'Südliche Klimatische Kurorte,' thus summarises the advantages

of San Remo: 'an equable warm air, absence of the dust and noise of a large town; a rich evergreen vegetation, abundant opportunity for exercise in the open air, without the great variations of temperature to which Nice is subject, and pleasing environs.'

'San Remo,' said the late Dr. Bottini of Mentone, 'where the Lemon tree likewise flourishes in the open air, is, from the clearness of its sky and the richness of its vegetation, one of the most salubrious stations of the south.'

Another well-known medical writer on climate, Dr. Edwin Lee, in 'Menton and San Remo,' after making some considerable quotations from the work of Dr. Prosser James, expresses his general concurrence in the observations of that writer, 'considering them valuable as coming from one whose attention has been directed to the subject of climate, and who, in thus speaking highly of San Remo, cannot be supposed to have been actuated by any motive of a personal nature.'

Dr. C. T. Williams has thus written of San Remo: 'The climate of San Remo is warm and dry, and from the protecting ranges not rising precipitously as at Menton, but sloping gradually back, the shelter from the northerly winds is not quite so perfect as at the last named place: at the same time the vast Olive groves screen the locality from any cold blasts, and the breezes which filter through the Olives impart a pleasing freshness to the atmosphere and remove sensations of lassitude often experienced in well-protected spots. The size of the sheltered area gives patients a considerable choice of residences, which can be found either close to or at varying distances from the sea, according to the requirements of the case.'

The last author whose opinion I will quote is Dr. Walshe: 'The Lemon tree flourishes with peculiar vigour; the flora of the district is marvellously beautiful. The air is dry, rainy days few and far between; the dust not seriously troublesome. The wideness of the space, encircled by the hills, allows of free (sometimes too free) movement of air in and about the town. The quality of the atmosphere seems to be tonic without being excitant, exhilarating and yet soothing.' In a word, the spot seems to 'combine in a modified degree the bracing qualities of Nice with the warmth but without the closeness of Mentone.' The noise of the surge gives no annoyance here as at Mentone,—the houses being built at some height above the sea-level.'

The following Table of the Comparative Temperature of different Health Resorts and Places, based on that of Sir James Clark, will be found useful for reference. It must be understood that the winter months include December, January, and February, except in the case of Port Jackson, Port Phillip, and Auckland; in these the winter months are June, July, and August; the spring September,

	Annual	Winter	Spring	Summer	Autumn
Cairo	72·17	58·52	73·58	85·10	71·48
Santa Cruz (Canaries)	71·09	64·65	68·87	76·68	74·17
Ceylon Hill District [2]	70·31	69·45	71·65	69·73	70·78
Malta [3]	67·28	57·46	62·43	78 20	71·03
Corfu	65·55	54·28	59·85	77·09	70·97
Madeira [1]	64·97	60·47	62·44	69·60	67·32
Algiers (added)	64·50	55·00	66·00	77·00	60·00
Palermo „	63·47	53·10	59·30	74·70	66·80
Port Jackson [2]	62·54	54·67	63·53	67·49	64·46
Cadiz	62·05	52·90	59·53	70·43	65·35
St. Michael's (Azores)	62·42	57·87	61·17	68·33	62·33
Naples	61·29	48·50	58·50	74·17	64·00
Mentone (added)	60·93	48·98	58·34	73·88	62·54
Rome	60·67	48·90	57·65	72·16	63·96
Pisa	60·38	46·37	57·19	75·19	62·80
Genoa	60·37	44·90	58·60	75·03	62·98
San Remo	60·13	48·89	57·32	72·45	61·86
Cannes	59·90	49 64	57·38	72·96	60·98
Marseilles	58·90	45·48	57·56	72·50	60·08
Toulon	58·41	43·33	57·00	74·33	59·00
Nice	59·48	47·82	56·20	72·27	61·63
Hyères	—	47·30	—	—	—
Florence	58·76	44·33	56·00	74·00	60·70
Port Phillip (N.S.W.) [2]	58·98	50·07	58·40	67·50	59·97
Auckland (N.Z.) [2]	58·42	50·68	56·82	66·38	59·82
Montpelier	57·58	44·33	53·33	71·33	61·33
Pau	56·18	42·53	54·06	70·73	57·40
Malaga (added)	—	56·00	—	—	—
Undercliff [1]	51·36	41·89	49·33	60·64	53·58
Ventnor (added) [4]	51·95	45·95	48·05	61·00	52·80
Torquay „	50·23	43·30	47·63	59·83	50·16
Bournemouth (added)	49·66	41·17	47·12	59·95	50·43
Paris	51·41	38·43	50·40	64·47	52·33
London [1]	50·39	39·13	48·76	62·32	51·35
Camden Town (added)	50·23	40·68	48·26	61·77	50·20
Greenwich (added)	48·53	37·97	46·50	60·20	49·46

October, and November; the summer December, January, and February; and the autumn March, April, and May. The original table contained many errors of calculation, which as far as possible have been rectified.

[1] Register Thermometer. [2] Common Thermometer. [3] Doubtful.

[4] These observations were taken at the Royal National Hospital for Consumption and Diseases of the Chest, Ventnor.

To convert Centigrade into Fahrenheit multiply by 1·80 and add 32 if above the freezing point, and subtract from 32 if below.

To convert Réaumur into Fahrenheit multiply by 2·25 and add 32 if above freezing and subtract from 32 if below.

CHAPTER IV.

Characteristic Vegetation of the Riviera—Shrubs and Flowers in blossom at San Remo in October and at the beginning of the Year—Scent-giving Flowers, Wild Shrubs, Plants, and Flowers—Vegetation of the Riviera, chiefly evergreen—Evidence of Mildness of the Winter Climate of the Riviera derived from the Vegetation—The Olive Tree—Gathering of the Olives—Process of obtaining the Oil—The Lemon Tree—The Orange Tree—The Vine—The Fig Tree—The Japanese Medlar—The Date Palm—The Carouba Tree—The Fir Tree—The Eucalyptus—The Pepper Tree—The Prickly Pear—Evidences of Mildness of the Climate derived from Birds—Fish—Reptiles—Insects—Butterflies and Moths—The Cicada—The Firefly—The Sacred Beetle—The Blister Beetle—Grasshoppers—Locusts—Praying Mantis—Mole—Cricket—Harvesting Ants—Scorpion—Trap-door Spiders—Mosquitoes.

THE mild character of the winter climate of San Remo and the Western Riviera generally has already been demonstrated by a variety of circumstances and data, but the proofs are not yet complete and others may now be cited of a different kind; namely those furnished by the Fauna and especially the Botany of the district. Most of the vegetation differs so much from that to which we are accustomed in Great Britain and other cold and northerly climates, that the aspect of the country is entirely changed, presenting to some extent a semi-tropical appearance.

Approaching the Riviera from Marseilles, the eye is first attracted by the Olive trees scattered here and there on the way—these are by no means large or imposing however until Cannes is reached; here the scene becomes completely changed and we see for the first time the vegetation which imparts to the Riviera its peculiar features. Thus we now notice extensive groves of large Olive trees, with some Orange trees, occasional Palms, and towering above all numerous magnificent specimens of the Blue Gum, or Eucalyptus globulus. This latter forms the most conspicuous feature in the landscape, although it is only little more than twenty years since it was first introduced into Cannes: so rapid, however, has been its growth, that many of the specimens have attained the dimensions of lofty forest trees; and so well has it flourished here that it has been planted nearly all along *the Riviera*, many fine trees being seen almost everywhere.

As we near Nice the number of Orange trees is seen to have increased; in sheltered situations groves of Lemon trees are also observed for the first time, while Palms occur more frequently. When we reach Mentone we find that the Lemon has almost taken the place of the Orange tree, and here we notice that the encircling hills are thickly clad with Olive trees of great size and age. At Bordighera the scene for a short distance becomes truly Oriental from the number and size of the groves of Palm trees, the age of some of which is said to exceed a thousand years. At San Remo the Lemon tree abounds as at Mentone, with of course many Orange trees, while here the protecting hills and sheltering valleys are clothed with perfect forests of Olive trees stretching far away to the base of the higher mountains. These Olive forests cover many miles of ground, and when we walk over the hills or through the valleys, we find that they are planted on terraces faced with walls of rough stones; of these terraces there are thousands, and the toil involved in their construction is almost inconceivable. When I first saw the vine-clad terraces at Rüdesheim on the Rhine, I was astonished at the labour which must have been expended on their formation, but these bear no comparison for extent with the Olive terraces in and around San Remo, and, indeed, many other places on the Western Riviera.

The three trees therefore, which give to the Riviera its special features are the Olive, Orange, and Lemon; add to these the majestic Eucalyptus and the graceful Palm, and the picture becomes tolerably complete.

But on the way along the Riviera, numerous other trees attract our notice; the Esterel mountains are clothed with fine specimens of the Cork tree, a species of evergreen oak, Quercus Suber; from the stems and branches of many of these, the outer bark or cork has been stripped, exposing to view the inner bark of a beautiful rich chocolate colour. So abundant are the cork trees on these mountains, that the removal of the bark constitutes a considerable industry.

Next we observe, as we near Cannes, many examples of that singular looking Fir, the Stone or Umbrella pine, Pinus Pinea; indeed just before entering Cannes there is a regular grove or plantation of them, and although specimens of this pine are occasionally to be met with further on the route, yet nowhere are they to be seen in such numbers and perfection as at Cannes. Then in many localities throughout the Riviera, especially on hill tops and other elevated situations, the pyramidal or Italian Cypress, Cupressus pyramidalis, is noticed, some of the trees being of great size and age; these are usually placed near churches or other buildings, which they appear to guard like sentinels, their lofty bare cylindrical stems and dark-green pyra-

midal summits towering above the surrounding trees and standing clearly out against the sky, thus constituting another characteristic feature of the Rivierean landscape. Another tree which attracts attention by its abundance and beauty is the Pepper tree, Schinus molle, with its graceful compound leaves and handsome bunches of coral-like berries.

But there are still a few other trees to be described before the list is complete. The Camphor tree, Camphora officinarum, grows freely in some parts of the Riviera; like so many of the other trees referred to, it is an evergreen. Another is the beautiful and majestic Carouba or Locust tree, Ceratonia siliqua, with its dark shining evergreen foliage and large bean-like pods, which contain so much sugar and nitrogenous matter that they are largely used for the feeding of cattle. 'Along with the Carouba may be mentioned Pistacia Lentiscus and Terebinthinus Chio, as peculiarly indicative of a dry, sunshiny southern climate and of a rocky arid region. P. Lentiscus is an evergreen shrub which grows freely in the same regions as the Carouba, flowering during the winter, and is very abundant between Nice and Ventimiglia, indeed all along the Riviera'—'it forms, I believe, one of the chief botanical features of Palestine and Syria.'—'Terebinthinus Chio is frequently met with on the most sheltered, sunniest, warmest, and most arid mountain sides. It is a ligneous shrub or small tree, and is remarkable as being the last tree or shrub met with in the Desert of Sahara on descending from the south slopes of the Atlas.' (Bennet.) Then there are many beautiful and elegant species of Acacia and Mimosa; these grow in great abundance nearly all over the Riviera, and some of them attain a very considerable size: they blossom freely early in the spring, the flowers giving forth a delicate and highly agreeable perfume, which in many places scents the surrounding air. Near the Château St. Léon at Cannes is an avenue of Acacias, which have attained almost the size of forest trees, and which in the spring when covered with their light-yellow blossom are exceedingly beautiful.

Another tree which attracts attention in many parts of the Riviera from its beauty is the Judas tree, Cercis Siliquastrum. This comes into flower early in the spring, the leafless branches being densely covered with the deep pink blossoms.

About the same time, in the gardens and up the valleys, the Almond and Peach trees, with their delicate pink blossoms, add a further charm to the scene, and form a beautiful contrast to the sombre green of the Olive trees; while here and there are seen the snow-white blossom of the cherry and some other fruit trees, this contrast of colour being equally pleasing.

Again, Fig trees, some of gigantic size, are everywhere met

with; while in many places the Vine is extensively cultivated; this in parts of the Riviera was destroyed some years since owing to the attacks of oïdium, and it has not been replanted to anything like its former extent.

In the course of the numerous small streams which flow from the valleys into the sea, large beds of reeds, resembling Canes or Bamboos, Arundo Donax, L., are seen, often attaining a height of fifteen or twenty feet, and so numerous are these that they also form one of the special features of the Rivierean vegetation. In the autumn the canes are cut down in large quantities and are much used for hedges and fences and as laths in buildings. It is from these canes that Cannes is said to have derived its name. Growing beside the streams, as well as in many gardens, fine specimens of the Oleander or rose Laurel, Nerium oleander, occur; these often reach a great size, becoming veritable trees, and when in blossom they are extremely beautiful. Another tree which not only blossoms here but ripens its fruit, is the Pomegranate, as also do the Shaddock and Citron.

Passing now from the larger trees, the Agave, Agave Americana, commonly called the Aloe, and the Prickly Pear, Opantia Ficus-Indica, also help to give a special character to the vegetation of the Riviera; these are both abundantly met with in many situations. The Agave grows very freely, and is often seen as a grand and massive-looking plant; the ordinary tradition respecting the Aloe is, that it blossoms but once in a hundred years, and that it dies in the effort of bringing its blossom and fruit to maturity. The tradition as to its blossoming only once in a century does not apply to the Agave, and it is a very common thing to see it in flower in the Riviera, and several even may be seen at the same time in one group. The Agave however really does gradually wither up and die after it has brought forth its blossom, and this is not surprising when we observe the mast-like flower stem which it throws up to the height of some twenty feet. The Agave contains strong elastic fibres which are used in England for brush making, and in Mexico for ropes and mats. The juice at the time of flowering contains so much sugar that it is fermented in Mexico, and an intoxicating drink prepared.

That curious Cactus, the Prickly Pear, a native of Mexico, reaches a considerable size, and flowers and ripens its fruit in great abundance. But very many other Cactaceæ flourish here equally well.

It will be observed that nearly all the trees which have been hitherto described are evergreens, and hence the landscape in winter bears the same fresh and green aspect that it does in summer.

The deciduous trees, excepting only the Fig and Oriental Plane, are for the most part met with at some distance from the sea, and are found at moderate elevations, either up the valleys or on some of the lower hills, as the Spanish Chestnut and many Fruit trees, the Peach, Almond, Cherry, Medlar, Apple, and Pear.

The Oriental Plane tree, in consequence of the luxuriance and density of its foliage, is found in many towns and is usually planted in avenues with a view to protection from the sun. This tree often grows to a great size; the leaves do not fall off till about the end of December, they are then carefully collected and given to the cows for food. At Cannes, Nice, Mentone, San Remo, and many other towns there are handsome avenues of these trees.

Above the region of the trees which have been hitherto noticed, and even of the Olive, which rarely grows at an elevation greater than 2,000 feet, the mountains become clothed with forests of evergreen firs, except where they are so steep that no soil exists for their growth, the principal species being Pinus maritima, the timber of which, although soft, is used for building. The Aleppo pine, Pinus Halapensis, is also common.

Quitting now those trees which impart to the landscape its general features, and entering some of the gardens along the Riviera, a whole host of beautiful flowering trees, shrubs, and flowers are met with, many of which in our own land are only to be found in greenhouses or even hothouses.

A great variety of the plants which grow and flourish out of doors here are of the tenderest kind, many of which would be fatally injured by the slightest frost; even the fruit of the Lemon tree falls off at 5° of frost and the tree itself is killed at about 8° Fahr.

Again, owing to the extreme mildness of the climate, very many of those flowers which are annuals in England and other equally cold countries, here become perennials, some of them attaining considerable size, rivalling veritable shrubs; this is the case with the Petunias, Stocks, Wallflowers, Carnations, Nasturtiums, and also with Cobæa scandens.

The characteristic Palm of this district is the date-bearing Palm, Phœnix dactylifera, but several other kinds grow freely without protection in the open air; as the fan-like Palms of the genera Latania and Chamærops, including L. Borbonica and C. excelsa; but a variety of genera and species are cultivated in the gardens of the wealthy, and amongst them the Cocoa-nut Palm. The only Palm indigenous to the Riviera is Chamærops humilis; but, even this, from some cause or other, is now extinct. Although the date-palm blossoms and bears fruit freely, the *bunches sometimes* weighing two or three kilogrammes, the dates

become ripe only in very warm and specially favourable situations.

In very sheltered situations, fine specimens of Musa or Banana are met with, the fruit sometimes even becoming ripe. There are some large examples of Musa paradisaica in the Public Garden at San Remo, as also at Bordighera. Musa Ensete is sometimes seen, the leaves of which are usually much grander than those of the first named species in consequence of their being entire and not slit into pieces.

Indeed, a great variety of tropical plants bearing fruit, not only grow in the most protected parts of the Riviera, but the fruit of very many of them even ripens there. This is the case with the following, all of which flourish in the very choice garden of Monsieur Dognin at Cannes, to whose kindness I am indebted for the subjoined list:—

Anona Cherimolia.
Anona Cinerea et divers.
Diospyros divers.
Eriobotria japonica.
Eugenia jambosa.
Garsinia australis.
Musa paradisaica.
Musa sapientum.
Persea gratissima.
Psidium Cattleÿanum.
Psidium montanum.
Psidium pyriferum.
Punica divers.
Cookia punctata.
Opuntia Ficus indica.
Cornelia fragrans.
Phœnix dactylifera.
Phœnix Leonensis.
Phœnix pusilla.

Several of the preceding species, as well as many other fruit-bearing kinds, are also found in the very interesting garden of Baron von Hüttner at San Remo, who has very kindly given me the following list:—

Anona triloba, L.—*Pennsylvania.*
Anona Cherimolia, Mill.—*Peru.*
Diospÿros Kaki.
A new fruit-bearing plant recently introduced from Japan. The fruit is about the size of a mandarine orange, of a yellow colour, and rather pleasant taste. It ripens in November.
Musa paradisaica, L.
Musa sapientum, L.
Opuntia Ficus indica, Mill.—*South America.*
Mespolus japonica amara, H.
Yucca buccata, Torr.
Bears a large banana-like, pleasant-tasting fruit.
Chamærops hÿstrix, Fras.—*Georgia.*
Bears sweet, edible berries.
Philodendron pertusum, Kth. e. B.
Eugenia Fambor, L. (Famboса vulgaris, D.C.).
Bears edible fruit, with a rose-like smell.
Persea gratissima, Gærtn.—*West Indies.*
Psidium Cattleÿanum, Lub.—*China and Brazil.*
Bears a very nice fruit of the size of a plum.
Psidium pyriferum, L.—*West Indies.*
Bears a pleasant-tasting fruit of the size of a hen's egg.
Cookia punctata, Retz.—*China.*
Phœnix dactylifera, L.

On arriving at San Remo about the middle of October the following shrubs and flowers are usually found in blossom in the gardens, and many of them so continue until the end of the year: the double Oleander; the Arbutus, which is then seen laden with its beautiful fruit; Viburnum tinus with its leaves and flowers so closely resembling those of a species of Laurustinus, and with its steel-blue berries; the several varieties of Euonymus, which, unlike that which grows so freely at Ventnor, here blossoms and even ripens its coral-like seeds; Tecoma radicans with its brilliant scarlet flowers; the Malvaceous plant, Sida venosa; several species of Solanaceæ, as Solanum glutinosum, with its turquoise-blue blossoms and marble-like bluish-black berries, and S. pseudo-capsicum; Datura Brugmansia, which grows at San Remo in great perfection, many specimens attaining a considerable size, and, when covered with their large white trumpet-shaped blossoms, presenting a very handsome and striking appearance; the very pretty Tree Veronica; the curious Castor-oil plant, Ricinus communis; Melianthus major with its splendid compound leaves; Gomphocarpus fruticosus with its singular bladder-like fructification.

Other plants and flowers also in bloom at this period of the year are the Heliotrope; the Verbena or Lemon plant, V. citrata; the pale blue Plumbago; as well as many kinds of Geraniums, Chrysanthemums, and Roses. The Rose tribe grows to perfection, and the most beautiful kinds are commonly met with.

With the new year a great variety of other shrubs and flowers come into blossom, the following being the more noticeable: Sparmannia Africana, Bignonia capensis, Abrotamnus elegans, Justicia adathoda, Cassia tomentosa, Jasminum humile, Osteospermum moniliferum, Mespilus Japonicus, Cratægus glabra, Spirea lanceolata, Sempervivum patulatum, Raphiolepsis Indica, Mioporum pictum and M. parviflorum, Pittosporum tobira Ait., Mimosa lophante, Viburnum lucidum, Abutilon Sumatrensis, the Marguerite, Chrysanthemum grandiflorum; Cineraria platanifolia, Ageratum celeste, v. cæruleum; and lastly, several species of Salvia, including S. involucrata.

Amongst creepers may be mentioned the following: the pretty white Solanum jasminoides; Lonicera periclymenum with its small black berries; the beautiful Bougainvillea spectabilis; species of Passion flower, and lastly, Mesem bryanthemum Dasyphyllum L. with its fleshy leaves and conspicuous white, pink, scarlet, and blue blossoms. This plant is seen everywhere, covering and giving verdure and beauty to rough banks and walls, which it does, not by climbing up after the fashion of most creepers, but by spreading over them from above. In this way

it hangs down and often covers walls of some ten or twelve feet in height, and it would doubtless extend still further were it not that at length the stems break off in consequence of the great weight they have to bear.

So favourable is the climate of the Riviera to the growth of scent-giving flowers that several kinds are extensively cultivated, especially in the neighbourhood of Cannes, for the manufacture of perfumes; thus large tracts of land are covered with Roses, one kind grown especially for the sake of the favourite White Rose Scent, another for the Essence or Otto of Rose, the quality of which is much superior to that from the East; other districts are planted with the white Jasmine; with Acacia Farnesiana, the Cassia of the Bible; and lastly, the double blue violet is cultivated in enormous quantities for the sake of its much prized perfume.

Unfortunately the San Remese, as well as the inhabitants of some of the other Rivierean towns, seem to care but little for flowers and gardening, and whatever beauty the gardens possess at San Remo is due rather to nature than to art. Most of the Lemon trees in the town are by no means striking examples of their kind, while the Orange trees are but poor specimens, and this simply because their cultivation is not appreciated for mere purposes of ornament.

Leaving now the gardens and strolling through the valleys, over the hills, and up the higher mountains, some of the principal shrubs, plants, and flowers which are met with growing wild, may now be very briefly noticed. On dry and sandy elevations in many localities a very beautiful and sweet smelling heath is found, remarkable for its size and for the very handsome spikes of blossom which it bears; this is the Mediterranean Heath, Erica arborea; it flowers in February and March. Unfortunately, large quantities of this heath are annually dug up for the sake of its roots, of which the so-called briar-root pipes are made. Another species is the well-known Ling heath, Calluna vulgaris, which comes into flower in December.

In the same situations different species of Phillyrea, P. angustifolia and P. latifolia, Rhamnus Alaternus, and Juniperus Oxycedrus are found.

The Myrtle, which with us grows only as a choice plant and in the most sheltered situations, requiring even then special protection in the winter, is met with as a wild shrub nearly all over the Riviera. The Iles Lérins, opposite Cannes, are almost covered with Myrtle, it forming in fact a kind of brushwood which is periodically cut down and used as fuel for bakers' ovens; in favourable situations, however, where it is allowed to grow

freely, it attains the size of the largest Laurustinus bushes, not only flowering but ripening its abundant blackish-blue berries.

Although the Strawberry Tree, Arbutus Unedo, is frequently seen in gardens, into which it is introduced in consequence of the great beauty of its fruit, which ripens only the second year, it is also found growing wild in many places.

Great numbers of leguminous plants are also seen, species of Spartium, Genista, Cytisus, and Coronilla.

A very bright and cheerful-looking plant, although a very common one, is the Prickly Broom, Calycotoma spinosa, with its abundant golden blossom; it flowers in the month of April, and makes up in a measure for the absence of the Furze. Spartium junceum, a species of Broom distinguished by its rush-like stems, the absence of regular leaves, and its yellow blossoms sometimes occurs in the same localities flowering about the same time.

Other plants which may be mentioned are the yellow Jasmine, Jasminum fruticans, Globularia Alypum, and Daphne gnidium.

Among other conspicuous wild plants are several species of Cistus or Rock rose, one distinguished by the large size of its pale pink blossoms and the white woolly under surface of its leaves, Cistus albidus. This species is found growing on the hills and mountains in large quantities in company with Rosemary and other plants of the same habit; this Cistus flowers in April.

Other species are Cistus salvifolius and C. monspeliensis; allied to Cistus are several species of Helianthemum.

A plant, which with us is chiefly confined to the greenhouse, namely the golden Coronilla, is here likewise numbered among wild plants; the kind most frequently met with is C. Emerus.

A species of Sarsaparilla, Smilax aspera, occurs in great abundance in the neighbourhood of San Remo, as also elsewhere in the Riviera. It is a very characteristic plant and is distinguished by its sagittate and prickly leaves, and its bunches of round cherry-like berries (see Fig. 8).

The figures of the several plants given were most skilfully and tastefully drawn from nature, upon the wood blocks in readiness for the engraver, by Mrs. Cox, to whom therefore I beg to render my warmest thanks. (See the Preface.)

A rarer plant is the Cneorum ricoccum, one of the Terebinthaceæ, known by its small dark-green leaves and three-lobed seeds; it flowers all the winter, and is found in elevated and dry situations.

Another class of wild plants deserving special notice are the curious Euphorbias, with their milk-like juice; some of these are perennials here; one, Euphorbia dendroides, attains in favourable situations, as between Villefranche and Mentone, the size of great bushes, distinguished by their light and refreshing green foliage.

Large plants of Rue, Ruta bractiosa, are also of frequent occurrence.

The Rosemary, Rosmarinus officinalis, which in England is a garden plant, is here found in profusion on the higher hills and mountains flowering all the winter.

Again, several species of *Lavender*, especially the true lavender, L. Vera, and the spike lavender, L. spica, are met with in great

FIG. 8.

SMILAX ASPERA.

profusion. The true lavender is usually found growing on the most stony and arid mountain sides, where but little else than itself and perhaps a few hardy but handsome thistles manage to live; these it literally covers in many situations with its pleasing blue blossoms. In the autumn, stills are carried up the mountains and the fresh flowers are distilled on the spot. The quantity of

oil obtained varies with the season, but 200 kilogrammes of the flowers and stalks yield about one kilo of oil. That which is obtained in the Alpes Maritimes of France finds its way for the most part to the perfumers of Grasse, whence some of it reaches England. The best French Oil of Lavender is sold by the perfumers at about 20 francs the kilogramme. The spike lavender is more locally distributed, and the oil being of an inferior aroma does not realise more than half the price. While the oil from

FIG. 9.

ADONIS AUTUMNALIS.

the true lavender is used for making lavender water and in perfumery generally, the spike oil is employed in the scenting of soap, for which purpose, in consequence of its strong camphory odour, it is well adapted.

I pass on now to the smaller kinds of wild flowers. Many so familiar to us in England are found also here, and a simple enumeration of the chief of these will be sufficient: as the very

pretty Pheasant's eye, with its cherry-red blossoms, imbedded in finely-cut and soft green leaves, Adonis autumnalis, but which in the Riviera comes into flower early in April (Fig. 9), and the still more attractive Love in a Mist, Nigilea damascena (Fig. 10). The common but very pretty Fumitory, Fumaria officinalis, the generic name of which is derived from the Latin word *fumus*, smoke, the ancients having attributed to

FIG. 10.

NIGILEA DAMASCENA.

the smoke of this plant the power to drive away evil spirits; the Stock, Matthiola; Wallflower, Cheiranthus; Wild Mignonette, Reseda phyteama; pink Soapwort, Saponaria officinalis, so named from its soapy juice; the Borage, Borago officinalis, which grows in great profusion and forms with its blue blossom so beautiful a contrast with many other flowers; Comfrey, Symphytum offici-

nalis; the Snapdragon, Antirrhinum; several species of Veronica or Speedwell; and of Verbascum; the Primrose, Primula acaulis; the Cowslip, P. veris; the scarlet Pimpernel, Anagallis arvensis, a blue variety of the same being also of not unfrequent occurrence; lastly, the Wild Thyme is met with nearly everywhere on the hills and mountains, it flowering throughout the winter and perfuming the air around.

I will now notice in the order of their appearance those wild flowers which either by their abundance or beauty constitute more or less conspicuous objects in the flora of San Remo and of other parts of the Riviera.

One of the wild flowers first observed on arrival here is a very curious species of Arum, A. Arisarum, distinguished by the cowl-like shape of the hood, which is of a shining brown chocolate colour; this Arum is so abundant that it is seen continually, sometimes in such profusion as to form large beds and to cover some of the Olive terraces. Its bulbous roots, like those of Arum maculatum, are very nutritious and capable of furnishing a kind of arrowroot.

Another flower which equally attracts attention at that time is a kind of Daisy, very different however from the one met with in our own country and which Burns has immortalised; it is not the 'wee, modest, crimson-tipped' flower of the poet, but it nearly rivals in size the ox-eyed daisy, the flowers standing elevated on stalks some six or eight inches long, always turning their faces gratefully to the sun. From the large size of the flowers, their abundance, and the fact that this daisy blossoms at the period of the year when there are so few wild flowers to be seen, it forms a very welcome and cheerful addition to the winter Flora.

About the middle of December the Sweet-scented Violet, Viola odorata, comes into blossom, and by the beginning of January the ground in many situations is literally carpeted with its blue flowers, and the air around laden with their sweet perfume; it is even found growing abundantly on the stone walls.

Soon after the appearance of the Violet the Hyacinths come into flower: that is to say, in January; of these there are four kinds, which, though called Hyacinths in common parlance, yet really belong to different genera. One of these is the Oriental Hyacinth, Hyacinthus orientalis; this grows in the greatest profusion in some of the valleys around San Remo, and hundreds of bouquets of it are sold daily by the children in the streets; it is the same Hyacinth which in England is cultivated in gardens and grown in glasses; it is usually of a blue or beautiful violet-blue colour, but a white variety is sometimes met with. Another is *the very pretty* little Grape Hyacinth, Botryanthus vulgaris Kunth,

formerly Hyacinthus botryoides Lin., and Muscari botryoides Mill; the blossoms of this are small, oval, deep blue, and closely aggregated into bunches resembling somewhat miniature grapes; this species is also found in abundance, and it possesses when first gathered a peculiar plum-like odour (Fig. 11). A third kind is Leopoldia comosa Parl., formerly Hyacinthus comosus Lin., and Muscari comosum Mill; it is distinguished by the tuft of abortive blossoms crowning each stem, by the sparseness of the flowers,

FIG. 11.

MUSCARI BOTRYOIDES.

and by these after a time turning from blue to brown; it is of much less frequent occurrence. The fourth kind I have met with is Bellevalia romana; this is a very singular-looking flower and by no means so pretty as those previously referred to; the blossoms closely crowded on the bluish stem in a pyramidal form are of a whitish colour shading into dull blue or green at the top. This species is only occasionally met with.

About the same time the Anemones appear; of these there are several species and many varieties, but most of the forms

found in the neighbourhood of San Remo, notwithstanding the diversity of their colour and appearance, resolve themselves into two species. One is Anemone coronaria L., the flowers of which are formed of large sepals; there are six principal varieties:—1, with scarlet flowers; 2, blue; 3, purple; 4, white and pink or rosy-coloured at the base; this latter variety is small, rather rare and sometimes called Anemone rosea; 5, yellowish white, tinted red at the base of the sepals or entirely white; 6, rose violet or white, à l'onglet violacé. The first four varieties are common, but I have not myself met with the last two. The second species is Anemone hortensis, the sepals of which are much narrower and hence more numerous than those of the former species; there are two chief varieties found at San Remo, one single and of a beautiful light mauve colour; this is sometimes called Anemone stellata; in the other, named A. pavonina, which may be either single, partly double, or double, the sepals are of a brilliant scarlet, yellow near the base on the inside, a circular disc being thus formed, while in the double flowers the sepals are green on the outside: this latter variety is sometimes called by the natives 'Marguerite,' but the true Marguerite is a Chrysanthemum, as already mentioned. We must not forget to notice amongst the Anemones the beautiful blue A. hepatica, also called Hepatica triloba, which is found abundantly on Monte Bignone and some of the highest mountains, a pink variety being also occasionally met with, As was the case with the Violets, immense quantities of Anemones are gathered in the valleys and woods around San Remo, and daily offered for sale in the town.

Other flowers which come into blossom in quick succession are different kinds of Narcissus, Tulip, Iris, and Gladiolus.

Of the Narcissus there are several species; that most commonly met with and which is to be found profusely scattered through most of the valleys is the very pretty species with golden yellow flowers, Narcissus Italicus Sims; another yellow but rare kind is N. biflorus; other kinds occasionally found are the very handsome white N. papyraceus Gawl and N. nivens; other species are N. Panizzianus Parl., N. Tazzetta, and N. Remopolensis; the latter was regarded as a variety of N. Tazzetta until its claims to a specific rank were established by the Cav^{e}. Francesco Panizzi, to whom I am much indebted for the names of many of the flowers I have met with in my various walks and excursions around San Remo. The Narcissi above named by no means include the whole of those found at San Remo; photographs of other kinds are included in 'La Flora Sanremese Fotografata,' of Signor Pietro Guidi, and by these they can be easily identified.

The Tulips chiefly seen are of two species; the first which comes into flower is of large size and brilliant scarlet colour, Tu-

lipa præcox Ten.; this is followed a little later by the very elegant Lady Tulip, distinguished by its white colour and broad pink band running down the outer surface of the petals, T. Clusiana D.C. (Fig. 12). Of the Iris there are at least three species, one of these being Iris Florentina L., the others are I. pseudo-acorus, and I. Germanica.

The only species of Gladiolus I have come across is Gladiolus segetum; this does not usually flower until the beginning of April, it then makes its appearance for many miles round San Remo in

FIG. 12.

TULIPA CLUSIANA.

vast quantities, and being of a very beautiful magenta colour, it forms one of the most conspicuous and attractive of the many flowers which at that season everywhere so abound.

Another spring flower which deserves a separate notice is the Star of Bethlehem, Ornithogalum divergens; the blossoms of this are remarkable for their pure white colour, and are distinguished by the outer surface of the petals being careened with green (Fig. 13).

Several species of the genus Allium grow around San Remo in great abundance; one of these is Allium nigrum, characterised

by its broad tulip-like leaves and large umbel of pinkish flowers. But the species which attracts the most attention and which is met with in some localities in the greatest profusion is A. Neapolitanum Cyr., A. album L. This is a particularly graceful flower, especially when it first comes into blossom; it is of the purest white, and from its beauty and abundance it is much used in bouquets and in Easter church decorations; the only drawback is

FIG. 13.

ORNITHOGALUM DIVERGENS.

its smell, and it has been found that this is removed by plunging the stems into boiling water (Fig. 14). Other species which grow in the neighbourhood are, A. triquetrum L., A. roseum L., A. subhirsutum L., and A. trifoliatum, all of which have been photographed by Signor Guidi.

In such profusion does the Allium Neapolitanum grow in many districts that the ground is whitened with the blossom. Another wild plant, which though far less beautiful also helps to produce

the same effect, is the common white scurvy grass, Cochlearia draba.

Early in April a very striking-looking Arum comes into blossom, A. Italicum ; its sheath is very large, nearly white, and when of its proper shape this Arum is really very handsome.

Among the Thistle tribe there is one which by its beauty and abundance, particularly in and around San Remo itself, challenges

FIG. 14.

ALLIUM NEAPOLITANUM.

observation, Galactites tomentosa Gaertn. ; this is at once distinguished by its green and white denticulated leaves and by the pale mauve colour of its flowers.

Other plants which cannot be passed by without a brief notice are, Ficaria ranunculoides Mœnch, formerly Ranunculus Ficaria L., which, conspicuous for its green leaves and large yellow shining blossoms, grows in great perfection in the valleys in damp situations near the streams ; the curious Umbilicus pendulinus DC., so common on stone walls, to which it gives verdure by its large round

shining green leaves; the very beautiful malvaceous mountain plant with its pale pink blossoms, Lavatera punctata; the nearly equally beautiful but less rare Convolvulus althæoides; the Cyclamen-like plant, Erythronium Dens Canis L., with its flesh-coloured upturned petals, met with so plentifully on the top of Monte Bignone; the very pale Periwinkle, Vinca media; and last but not least the elegant Caper plant, Capparis spinosa, which, although a tropical plant, here ripens its fruit freely. Several species of Flax are met with among the rocks, particularly Linum narbonense, L. maritimum, and L. visosum, with their blue, yellow, or rosy flowers.

'Close upon the sea shore the stock, or Matthiola incana, has taken possession of the most inaccessible spots upon the cliffs, which it lights up with its bright violet flowers; the handsome yellow-flowered leguminous shrub, Coronilla Valentina, roots itself in the clefts of the rocks, where it is associated with the singular Cneorum ricoccum, a European representative of the tropical family of the Simarubeæ, while the white-leaved Cineraria maritima and the beautiful Lavatera maritima, with its large flowers of pale rose, form other striking elements in the Flora of the sea cliffs. Lower down, over the dry sandy beach, the Squirting Cucumber, Ecballium Elaterium, sends out its prostrate stems, and covers the ground with its fine dark green foliage; while here and there the curious Thymelaceous plant, Passerina hirsuta, presents us with a form of vegetation unknown in the Flora of the North.' (Professor Allman.)

The family of the Orchids—Orchis, Ophrys, Serapias, Epipactis, &c.—is particularly well represented on the Riviera and in the neighbourhood of San Remo. The handsome Bee Orchis is found in such large quantities that bunches of it are often seen in the baskets of wild flowers carried about by the children, as is also sometimes Barlia longibracteata Parl. Signor Guidi has photographed most of the kinds met with.

As might be supposed, from the many rocks, bridges, aqueducts, and stone walls near San Remo, Ferns abound. One of the kinds most commonly met with is the elegant and with us much prized Maiden Hair fern, Adiantum Capillus Veneris, called by the Italians 'erba della fontana;' an infusion made from its leaves is sometimes drunk as tea. Other ferns which are also very abundant are the common Maiden Hair Spleenwort, Asplenium Trichomanes, known by its delicate narrow fronds and opposite oval leaflets, and the Scaly Spleenwort, Ceterach officinarum, distinguished by the brown chaff-like scales and curled extremities of the fronds. Kinds less frequently seen are, the Black Maiden Hair Spleenwort, Asplenium adiantum nigrum, and the variety of this, sometimes called the Acute Spleenwort, A.

acutum Pollin., and the common Polypody, Polypodium vulgare. In damp situations, specimens of the very pretty Lycopodium denticulatum are also met with.

But a great many other flowering plants and shrubs are encountered in the rambles around San Remo in addition to those which have already been referred to—as the following: Oxalis corniculata; Königa maritima; Odoastrum rubrum; Urospermum Daleschampii Desf. with its large pale yellow blossoms, and Pyrethrum Myconis Mœnch, with its rich yellow flowers; Cineraria maritima; Globularia Alypum and G. vulgaris; Pulmonaria angustifolia; Symphytum bulbosum; and Omphalodes verna Mœnch; the last three belonging to the Borage family; the Samphire, Crithmum maritimum, which belongs to the Umbelliferæ, many curious and rare species of which are to be found flourishing on the rocks near the sea and on the mountains; Crocus medius and C. versicolor; Scilla maritima and Nectaroscilla hyacinthoides. In addition to the plants which have been already mentioned I have found some others; the principal of these are referred to in connection with the localities where they were met with.

There are still, however, a great number of beautiful wild flowers to be found in the valleys and on the hills and mountains around, and within a short distance of San Remo. The more important of these will be found enumerated in the following instructive and comprehensive classified list, for which I am indebted to the great kindness of the Rev. Clarence Bicknell, of Bordighera, who has made the botany of the district a subject of special study.

'The following list of flowering plants gives most of those likely to be met with in one day excursions from San Remo. Only those British plants which are comparatively uncommon at home have been included, such as Adonis autumnalis, Trifolium ochroleucum, &c. A great many of the cruciferous, umbelliferous, and compositous flowers have been omitted, also docks, willows, sedges, grasses, &c., being usually less interesting to amateur botanists, as well as more difficult to determine.

'The district chosen has been from the Argentine to the Roya, inclusive, and for convenience sake this area has been arbitrarily divided into two districts, that of San Remo (R.), from Taggia to Ospedaletti, including Monte Bignone, and that of Bordighera (B.), from Ospedaletti to Ventimiglia, including the Roya valley as far as Airole, and the ridge on which Caslet d'Appio stands above the town of Ventimiglia.

'The amphitheatre of San Remo and the mountain ridge by which it is bounded contain many plants not found in the Bordighera district, while the marshy fields and broad torrent beds and sands of the Roya and Nervia rivers contain many not

found in the San Remo district, including some carried down from their natural homes far away in the higher regions. All the plants here mentioned have been seen by the compiler within the last three years, between the beginning of October and the end of May.

'Rare plants are marked by an asterisk, and B. and R. denote that the plant has only been gathered in the Bordighera or the San Remo district, and is probably not found, or if so, very rarely, in the other. Professor Arcangeli's "Flora Italiana" is strongly recommended, and the "Nouvelle Flore Française," by Gillet and Magre, with illustrations, will be found very useful. Ardonio's "Flore des Alpes Maritimes" gives nearly all the plants here mentioned, but is far less satisfactory.'

Ranunculaceæ:—

	Clematis flammula, L.	October.
	Anemone coronaria, L (4 or 5 varieties of colour)	Jan.—March.
	,, hortensis, L. (vars. stellata, pavonina, fulgens)	Feb.—March.
	,, trifolia, L. (white flowers)	March—April.
*R.	,, ranunculoides, L. (yellow)	March—April.
	,, hepatica, L. (blue, rarely pink and white)	March—April.
	Adonis autumnalis, L. (pheasant's eye)	April—May.
	Ranunculus muricatus, L. (buttercup)	March—May.
	,, parviflorus, L.	,,
	Nigilea damascena, L. (Love in a Mist)	April—May.
	Helleborus fœtidus, L.	Jan.—April.

Papaveraceæ:—

	Papaver hybridum, L. (poppy)	April—May.
B.	Hypecoum procumbrus, L.	March—May.

Fumariaceæ:—

	Fumaria capreolata, L.	Jan.—May.

Cruciferæ:—

*B.	Brassica olesacea, L. (cabbage, wild on precipitous cliffs)	March—May.
*B.	Moricandia arvensis, D.C. (lilac flowers)	Jan.—May.
B.	Matthiola sinuata, R. Br. (stock)	March—May.
R.	Cheiranthus cheiri, L. (wall-flower)	April—May.
B.	Erysimum australe, Gay (yellow)	March—May.
	Alyssum maritimum, Lamck. (white)	All the season.
	,, calycinum, L. (yellow)	April—May.
	Lepidium graminifolium, L. (white)	May—Oct.
	,, draba, L. (white)	April—May.
	Biscutella lævigata, L. (yellow)	April—May.
	Calepina corvini, Desv.	April.

Resedaceæ:—

	Reseda phyteama, L. (mignonette)	All the season.

Cistaceæ:—

	Cistus albidus, L. (magenta flowers)	April—May.
	,, salvifolius, L. (white)	,,
	,, monopeliensis, L. (white)	,,
	Helianthemum fumana, Dun. (yellow)	,,
	,, italicum, Pers. (yellow)	,,

Polygalaceæ:—
Polygala nicæensis, Risso (Milkwort) . . . . April—May.

Caryophyllaceæ:—
Gypsophila Saxifraga, L. . . . . April—Oct.
Saponaria ocymoides, L. (Soap-wort) . . . . March—May.
„ vaccaria, L. . . . . May.
„ officinalis, L. . . . . „
B. Silene sericea, All. (pink) . . . . April—May.
„ fuscata, Link. (pink) . . . . March—April.
„ italica, Pers. (white) . . . . April—May.
„ gallica, L. (pink) . . . . „
„ nocturna, L. (white) . . . . „

Tamariscineæ:—
Tamarix africana, Poir. . . . . „
B. Myricaria germanica, Desv. . . . . „

Hypericineæ:—
B. Hypericum Coris, L. (St. John's Wort) . . . . May.
Androsæmum officinale, All. . . . . „

Malvaceæ:—
Malva nicæensis (Mallow), All. . . . . „
B. Lavatera maritima, L. . . . . Jan.—May.
Althæa hirsuta, L. . . . . May.

Geraniaceæ:—
*R. Geranium tuberosum, L. . . . . March—April.
„ sanguineum, L. . . . . May.
Erodium malacoides, Willd. . . . . April—May.
„ romanum, Willd. . . . . „
„ ciconium, Willd. . . . . „
„ moschatum, L'Hérit. . . . . „

Oxalidaceæ:—
*R. Oxalis cernua, Thunb. (yellow) . . . . Feb.—April.
„ corniculata, L. (yellow) . . . . All the season.

Linaceæ:—
B. Linum maritimum, L. (Flax) (yellow) . . . . Oct.—May.
„ gallicum, L. (yellow) . . . . May.
„ strictum, L. (yellow) . . . . „
B. „ viscosum, L. (pink) . . . . „
„ narbonense, L. (blue) . . . . „
„ tenuifolium, L. . . . . „

Rutaceæ:—
Tribulus terrestris, L. . . . . „
Ruta bracteosa, D.C. . . . . March—May.

Coriarieæ:—
Coriaria myrtifolia, L. . . . . March—April.

Anacardiaceæ:—
Pistacia Lentiscus, L. . . . . April.
„ Terebinthus, L. . . . . „
Rhus Cotinus, L. . . . . May.

Rhamnaceæ:—
Rhamnus alaternus, L. . . . . March.

Leguminosæ :—

Calycotome spinosa, Link.	April.
Spartium junceum, L.	May.
B. Genista cinerea, D.C.	April—May.
„ pilosa, L.	„ „
„ germanica, L.	May.
R. Cytisus Laburnum, All.	„
„ sessilifolius, L.	April—May.
R. „ triflorus, L'Hérit.	„ „
R. „ hirsutus, L.	May.
Argyrolobium Linnæanum, Walp.	April—May.
Ononis Natrix, L.	May.
„ minutissima, L.	May—Oct.
Medicago falcata, L.	April—May.
„ marina, L.	„
„ orbicularis, All.	„
„ Murex, Willd.	„
„ littoralis, Rhode	„
„ minima, Lamck.	„
Melilotus sulcata, Desf.	„
„ parviflora, Desf.	„
B. „ italica, Lamck.	„
Trifolium angustifolium, L.	May.
„ ochroleucum, L.	„
„ rubens, L.	„
„ lappaceum, L.	„
„ incarnatum, L.	„
„ stellatum, L.	April—May.
„ tomentosum, L.	May.
„ resupinatum, L.	„
„ montanum, L.	„
„ nigrescens, Viv.	April—May.
„ patens (yellow)	May.
*R. Anthyllis barba-Jovis	April—May.
„ tetraphylla	„
Trigonella monspeliaca, L.	„
Dorycnium suffruticosum, Vill.	May.
„ rectum, Ser.	„
„ hirsutum, Ser.	„
Lotus edulis, L.	April—May.
„ ornithopodiodes, L.	„
„ cytisoides, All.	„
Tetragonobolus siliquosus (yellow), Roth	„
*R. „ purpureus (scarlet), Moench	„
Psoralea bituminosa, All.	May.
Astragalus purpureus, Lamck.	„
*R. „ pentaglottis, L.	„
„ hamosus, L.	„
*B. „ aristatus, L'Hérit.	„
„ monspessulanus, L.	April—May.
Scorpiurus subvillosa	„
Coronilla Emerus	March—April.
„ valentina	„
„ minima	May.
„ varia	„
„ scorpioides	April—May.

*B. Hippocrepis ciliata	April—May.
„ unisiliquosa	„
Bonaveria securidaca	„
Onobrychis supina	May.
„ Caput-galli	„
„ canescens, G. & G. (blue and white)	„
Lathyrus Ochrus, D.C. (yellow) (Pea)	April—May.
„ Clymenum, L.	„
„ sphæricus, Retz (scarlet)	„
„ setifolius, L. (scarlet)	„
„ Cicera, L. (scarlet)	„
„ annuus, L. (yellow)	„
„ latifolius, L.	May.
„ Aphaca, L. (yellow)	April—May.
Vicia lutea, L. (Vetch) (yellow)	May.
„ hybrida, L. (yellow)	April—May.
„ peregrina, L. (purple)	„
„ Gerardi, All. (purple)	May.
„ tenuifolia, Roth. (purple)	„
„ varia, Host	„
„ bithynica, L. (lilac and white)	April—May.
Rosaceæ:—	
Potentilla verna, L.	„
„ hirta, L.	May.
Amelanchier vulgaris, Moench (white)	March—April.
Lythraceæ:—	
Lythrum Graefferi, Ten.	May.
Myrtaceæ:—	
Myrtus communis, L.	May—Oct.
Saxifragaceæ:—	
Saxifraga granulata, L.	April—May.
„ cuneifolia, L.	May.
Umbelliferæ:—	
B. Echinophora spinosa, L.	Oct.
Bupleurum protractum, Link	May.
R. Meum athamanticum, Jacq.	„
R. Tordylium apulum	April.
B. Orlaya maritima, Koch	May.
Caucalis daucoides, L.	„
Rubiaceæ:—	
Galium lucidum, All. (Bedstraw)	„
„ saccharatum, All.	April—May.
Asperula arvensis, L. (Woodruff)	„
Crucianella angustifolia, L.	May—Oct.
Caprifoliaceæ:—	
Viburnum Tinus, L.	Feb.—March.
Lonicera implexa, Ait. (Honeysuckle)	May.
Valerianeæ:—	
Valerianella discoidea, Lois.	„
„ coronata, D.C.	„
„ truncata, D.C.	„
*R. Fedia cornucopiæ, Gærtn.	„

Dipsacaceæ:—

R. Cephalanthera transsylvanica, L. . . . . Oct.
Scabiosa integrifolia, L. . . . . May.
„ maritima, L. . . . . „

Compositæ:—

Echinops Ritro, L. . . . . Oct.
Cirsium monspessulanum, All. . . . . May—Oct.
Cardius tenuiflorus, Curt. . . . . April—May.
Galactites tomentosa, Moench. . . . . March—May.
Centaurea aspesa, L. . . . . May—Oct.
„ paniculata, All. . . . . May.
„ montana, L. . . . . „
„ Jacea, L. . . . . May—Oct.
„ amara, L. . . . . „
Crupina vulgaris, Cass. . . . . April—May.
Stœhelina dubia, L. . . . . May.
B. Plagius virgatus, D.C. . . . . May—Oct.
B. Diotis candidissima, Desf. . . . . May.
Helichrysum Stœcas, D.C. (Immortalie) . . . April—May.
Evax pygmæa, Pers. . . . . „
Phagnalon sordidum, D.C. . . . . May.
„ saxatile, Cass. . . . . April—May.
Calendula arvensis, L. (Marigold) . . . . Dec.—May.
Erigeron canadensis, L. . . . . Oct.
Aster acris, L. (Michaelmas Daisy) . . . . „
Asteriscus spinosus, G. & G. . . . . May.
Inula viscosa, Ait. . . . . Oct.
Senecio erraticus, Bert. (Ragwort) . . . . „
„ Cineraria, D.C. . . . . May.
Bellidiastrum Michelii, Cass. . . . . „
Bellis sylvestris, Cyr. (Daisy) . . . . Oct.—Jan.
Chrysanthemum Myconis, L. (Ox-eye Daisy) . . . April—May.
*B. „ coronarium, L. . . . . May.
B. Lactuca perennis, L. (Lettuce) blue . . . May.
Hyoseris radiata, L. . . . . April—May.
Rhagadiolus stellatus, D.C. . . . . „
Scorzonera hispanica, L. . . . . May.
Tragopodon australis, Jord. . . . . „
R. Geropodon glaber, L. . . . . „
Urospermum Daleschampii . . . . . „
Scolymus maculatus, All. . . . . Oct.

Campanulaceæ:—

Specularia hybrida, DC. . . . . May
„ falcata, DC. . . . . „
„ Campanula Medium, L. . . . . „
„ Rapunculus, L. . . . . „
„ Erinus, L. . . . . „
„ macrorrhiza, Gay . . . . . Nearly all the season.

Cucurbitaceæ:—

Ecbalium Elaterium, Rich. . . . . May.

Ericaceæ:—

Erica arborea, L. . . . . Feb.—April.

Oleaceæ :—

Fraxinus Ornus, L. . . . . May.
Phillyrea angustifolia, L. . . . . April—May.
„ latifolia, L. . . . . „

Apocynaceæ :—

B. Nerium Oleander, L. . . . . May—Oct.
Vinca media G. & G. (Periwinkle) (white) . . . Dec.—May.

Gentianaceæ :—

Erythræa spicata, Pers. (pink) . . . . . May.
„ maritima, Pers. (yellow) . . . . . „
R. Gentiana acaulis, L. . . . . „
R. „ verna, L. . . . . „

Convolvulaceæ :—

Convolvulus althæoides, L. . . . . April—May.
„ cantabrica, L. . . . . May.

Boraginaceæ :—

Cerinthe aspera, Roth . . . . . March—May.
Symphytum bulbosum, Schimp. . . . . April—May.
Anchusa italica, Retz (blue) . . . . . „
*B. „ undulata, L. (purple) . . . . . „
Lithospermum purpureo-cæruleum (blue) . . . . „
*R. „ apulum (yellow) . . . . . May.
Cynoglossum pictum, Ait. . . . . „
*R. Omphalodes verna, Mœnch. (blue) . . . . April—May.
Heliotropium europæum L. (Heliotrope) (white) . Oct.
Pulmonaria saccharata, Mill. . . . . April.

Solanaceæ :—

Hyoscyamus albus, L. (Henbane (yellow) . . April—May.

Plantagineæ :—

Plantago Cynops, L. . . . . May.
„ Psyllium, L. . . . . April—May.
„ Lagopus, L. . . . . May.

Scrophulariaceæ :—

Verbascum, L. (Mullein) Boerhavii . . . . . „
„ Blattaria, L. . . . . Oct.
„ sinuatum, L. . . . . May.
Scrophularia lucida, L. . . . . April.
„ peregrina, L. . . . . „
Antirrhinum Orontium, L. (pink) . . . . Almost all the season.
„ latifolium, DC. . . . . Almost all the season.
* Veronica Teucrium, L. (blue) . . . . . May.
„ Cymbalaria, Bod (white). . . . . Feb.—May
Digitalis lutea . . . . . May.
Linaria simplex, D.C. (yellow) . . . . . April—May.
* „ chalepensis, Mill. (white) . . . . . „
Odontites lutea, Reichb. . . . . Oct.
Bartsia viscosa, L. . . . . May.

Orobanchaceæ :—

Orobanche cruenta, Bert. . . . . „
„ speciosa, D.C. . . . . „

Orobanche caryophyllacea, Sm. . . . . May.
* „ concolor, Duby . . . . . „

Labiatæ :—
Calamintha Nepeta, Savi. . . . . Oct.
Lavandula officinalis, L. . . . . May.
„ Stœchas, L. . . . . March—April.
Rosmarinus officinalis, L. . . . . Oct.—May.
Thymus vulgaris, L. . . . . April—May.
Sideritis romana, L. . . . . May.
Stachys recta, L. . . . . „
*B Ballota spinosa, Link . . . . . „
Brunella hyssopifolia, L. . . . . „
Ajuga Iva, Schreb. . . . . „
Teucrium Botrys, D. . . . . „
„ Polium, L. . . . . „
„ montanum, L. . . . . „
„ Chamædrys, L. . . . . „
„ Scordium, L. . . . . „
Lamium amplexicaule, L. . . . . March—May.
Melittis Melissophyllum, L. . . . . April—May.

Verbenaceæ :—
B. Vitex agnus-castus, L. . . . . October.

Primulaceæ :—
Coris monspeliensis, L. . . . . April—May.
Anagallis cærulea, Schreb. (Pimpernel) . . . . Nearly all the season.
B. „ tenella, L. . . . . May.

Globulariaceæ :—
Globularia vulgaris, L. . . . . April.
„ Alypum, L. . . . . Oct.—May.

Plumbagineæ :—
Statice cordata, L. . . . . October.

Phytolaccaceæ :—
Phytolacca decandra, L . . . . . „

Urticaceæ :—
Thelygonum Cynocrambe. . . . . Feb.—May.
Urtica membranacea (Stinging Nettle) . . . . April.

Polygonaceæ :—
Polygonum maritimum, L. . . . . May—Oct.
Rumex bucephalophorus, L. . . . . April—May.

Daphnaceæ :—
Daphne Gnidium, L. . . . . Oct.

Santalaceæ :—
Thesium divaricatum (Jan.) . . . . . April—May.
Osyris alba, L. . . . . May.

Aristolochiaceæ :—
*R. Aristolochia pallida, Willd. . . . . „
„ rotunda, L. . . . . „
B. „ Clematitis, L. . . . . „

Cytineæ :—
* Cytinus Hypocistis, L. . . . . April.

Euphorbiaceæ :—

*B.	Euphorbia	Preslii, Guss.	Oct.
	,,	Peplis, L.	May.
	,,	pubescens, Vahl	April.
R.	,,	verrucosa, Lamck.	,,
	,,	dulcis, Jacq.	,,
	,,	spinosa, L.	March.
*R.	,,	platyphylla, L.	May.
	,,	falcata, L.	,,
	,,	segetalis, L	All the season.
*B.	,,	terracina, L.	Feb.—May.
	,,	serrata, L.	April—May.
	,,	dendroides, L.	March—April.
	,,	Esula, L.	April—May.
	,,	Cyparissias, L.	,,
	,,	Characias, L.	Feb.—May.

Orchidaceæ :—

	Limodorum	abortivum, Sw.	May.
	Cephalanthera	rubra, Rich.	,,
	,,	ensifolia, Rich.	April.
	,,	pallens, Rich.	May.
	Cœloglossum	viride, Hartm.	,,
	Nigritella	globosa, Reichb.	,,
	Serapias	Lingua, L.	April—May.
	,,	longipetala, Poll.	,,
	,,	cordigera, L.	,,
*	Barlia	longibracteata, Parl.	Feb.—March.
*R.	Orchis	papilionacea, L.	May.
B.	,,	coriophora, L.	,,
	,,	tridentata, Scop.	,,
	,,	purpurea, Huds.	,,
	,,	provincialis, Balb.	April—May.
	,,	Simia, Lamck.	May.
B.	,,	laxiflora, Lamck.	,,
R.	,,	sambucina, L.	,,
	,,	intacta, Link	April.
*B.	Ophrys	bombilifera, Link	,,
*R.	,,	Bertolonii, Moretti	May.
	,,	lutea, Cav.	April.
	,,	fusca, Link.	,,
	,,	aranifera, Huds.	April—May.

Iridaceæ :—

	Crocus	versicolor, Ker	Feb.—March.
	,,	medius, Balb.	Oct.
	Gladiolus	segetum, Gawl.	April—May.
*R.	Iris	florentina, L. (white)	April.
	,,	germanica, L. (purple)	,,
*B.R.	Hermodactylus	tuberosus, Salisb.	March.

Amaryllidaceæ :—

	Pancratium	maritimum, L.	Oct.
*	Narcissus	poeticus, L. (white)	April.
*	,,	papyraceus, Gawl. (white)	Jan.—Feb.
*R.	,,	Panizzianus, Parl. (white)	February
*R.	,,	aureus, Lois. (yellow)	,,

*R. Narcissus Bertolinii, Parl. (yellow)	February.
„ Tazzetta, L.	March—April.
„ remopolensis, Panizzi	April.
*R. „ elatus, Guss.	Feb.
* Ajax incomparabilis, Car. (yellow)	Feb.—March.
Asparagaceæ :—	
Asparagus acutifolius, L.	Oct.
Smilax aspera, L.	„
Liliaceæ :—	
*B. Lilium pomponicum, L. (vermilion)	May.
R. Erythronium dens-canis	April.
Tulipa præcox, Ten.	March—April.
„ Clusiana, DC.	„
*B. Fritillaria involucrata, All.	March.
Ornithogalum divergens, Bor.	April.
*B. „ pyrenaicum, L.	May.
„ narbonense, L.	„
* Scilla hyacinthoides, L. (Squill)	„
„ italica, L.	March—April.
Hyacinthus orientalis L. (blue and white)	March.
Bellevalia romana, Reichb.	„
*B. „ Webbiana, Parl.	„
Muscari comosum, Mill.	April—May.
„ racemosum, Medik.	April.
* Asphodelus albus, Willd.	May.
Phalangium Liliago, Schreb.	„
*B. Aphyllanthes monspeliensis, L.	„
Allium nigrum, L.	„
„ triquetrum, L.	„
„ neapolitanum, Cyr.	March—April.
„ roseum, L.	May.
„ subhirsutum, L.	April—May.
„ Ampeloprasum, L.	May.
Araceæ :—	
Arum italicum, Mill.	April—May.
Arisarum vulgare, Targ.	Nov.—April.

In such profusion do the various kinds of wild flowers grow in the valleys and on the hills around San Remo, that they are daily sold in the streets; from the beginning of January until nearly the end of April the flowers are made up into hundreds of tempting little bunches and the air of the Esplanade is frequently perfumed with their scent. In no other place have I ever met with wild flowers in such quantities and of so many kinds. Occasionally the roots are dug up with the flowers and offered for sale; this practice is of course strongly to be condemned, and should be discountenanced as much as possible. It is to be feared that the wholesale way in which the wild flowers are gathered, rendering their seeding impossible, will ere *long* seriously affect the supply, but the removal of the roots will *certainly be fatal*. Some species have already disappeared.

The extreme dryness of the climate of the Riviera more particularly during the summer, rain often not falling for months together, influences greatly the character of the vegetation. Those trees and plants thrive best which throw out the strongest and longest roots, whereby they are enabled to supply themselves with the necessary moisture from the soil, and which also part with the moisture so obtained with the least facility by evaporation from the leaves. Thus the Aloe is not only remarkable for the depth to which its roots penetrate but for the density of its epidermis: the leaves of Evergreens in general, having also a dense cuticle, retain their moisture much longer than do those of deciduous trees, and hence are enabled to sustain drought for a longer period, and in this fact we are furnished with one of the reasons why the vegetation of the Riviera is principally evergreen.

The epidermis of many Cacti is so thick that these plants also lose their moisture only with difficulty, and hence they are particularly adapted to a sandy dry soil and hot atmosphere. Another class of plants which grow freely in the Riviera and resist for a long time the effects of drought, are the Euphorbiaceæ, but this for a different reason; the juices of these plants are thick and form an emulsion which contains a kind of india-rubber.

Such is the dryness of the climate that very many deciduous and delicate shrubs and flowers are unfitted for it, or grow only during the moister periods of the year, or, in the summer, when constantly watered, and as the process of watering at that season is in most cases laborious, and hence costly, some plants are either not cultivated at all or are allowed to die in the summer, to be replanted again in the autumn. This is the case with the grass forming the lawns in the grounds of many villas at Cannes, the grass seed being sown afresh each winter season.

But not only do flowers and small shrubs require to be kept constantly watered in the summer, but even the Lemon and Orange trees, especially the former. Now fortunately the means exist whereby this may be accomplished without too great expense, especially in the neighbourhood of San Remo. As has already been stated, a stream runs through each of the several valleys which lie east and west of the town, and these streams are made to supply innumerable reservoirs and tanks, the water being distributed from these by means of small aqueducts to all the low-lying lands, which can thus be irrigated whenever necessary.

Where streams do not exist the tanks are filled from wells. In the neighbourhood of Cannes, partially sunk in the ground, huge vase-like jars are frequently seen; these are employed for

the storage of water or manure; but the same description of jar is also used for olive oil. These jars resemble in size and form exactly those which I have seen on the stage in the pantomime of the 'Forty Thieves;' it was doubtless in precisely similar jars that those redoubtable thieves were concealed, and in which they met their well deserved fate.

The evidences then of the extreme mildness of the winter climate of the Riviera and particularly of its more sheltered parts derived from the Flora are numerous and may be thus summarised. 1. The fact that many plants which in England would be surely killed, live here throughout the winter in the open air. 2. That they not only live and grow, but many of them blossom freely during the whole winter. 3. That some plants which in England and other countries having a similar climate are annuals only and attain but small size, here become perennials, growing even into shrubs. 4. The growth in the open air throughout the winter of many plants and flowers which with us can be preserved only in green-houses or even hot-houses. 5. Notwithstanding that the leaves fall off and the blossoms are injured by one or two degrees of frost; that the fruit falls off at 5° and the tree itself is killed at about 8° of frost, the Lemon tree grows and flourishes here through a long series of years without being killed or even seriously injured. 6. That the Flora of the Riviera includes as we have seen numerous trees and shrubs of a semi-tropical character, as many kinds of Palms and Bananas; the Orange, Lemon, Pomegranate, and Olive trees; the Carouba or Locust tree; Pistachia Lentiscus; Terebinthinus Chio; the Oleander; Myrtle; Caper plant; the Aloe; the Prickly Pear, and the bush-like Euphorbia. All of these grow freely without artificial protection of any kind.

Having brought this somewhat rapid sketch of the vegetation of the Riviera to a close, some fuller particulars may now be given of a few of the more important and characteristic trees. The first to be noticed is the Olive tree, since it is the most conspicuous and abundant of them all, it claiming the hills and valleys for its own. Although the Olive tree has taken possession of the Riviera, it is really a native of the Holy Land, but it has evidently found here conditions of soil and climate not less favourable than those of its own country.

The Olive tree, Olea Europea, is an evergreen of slow growth, attaining under favourable conditions the size of a forest tree and flourishing for many centuries. The finest and oldest Olive trees are found from Nice to Oneglia. At Beaulieu is a very remarkable one, which has a girth of 23 feet at 4 feet from the ground, and which formerly yielded 500 lbs. weight of oil; its

supposed age being about 1,000 years. There are many varieties of the Olive tree—that of the Riviera is distinguished by the name Pleureur, from its weeping or pendulous branches. The mode of growth is singular; the younger trees usually consist of a single trunk which divides at a short distance from the ground into two or three primary branches, and this trunk is often irregularly twisted and contorted. When the tree has attained any considerable size, the interior frequently decays and the outer part of the trunk with the bark becomes split up into two or three segments; the bark then gradually encircles the separate portions until each becomes coated all round and several stems are thus formed out of the original single trunk. Why the inner portion of the tree should be so prone to decay is not very apparent, but it may be caused in some cases by the admission of moisture through the numerous fissures and holes in the bark; these extend some distance into the substance of the tree, and from their number one would be led to suspect that many of them are the work of some boring moth. This splitting up of the tree into smaller trunks and the forms thus assumed are often very singular.

The roots are very large and massive; they spread round the tree for a considerable distance, and some of them penetrate deeply in search of the nourishment which is contained but sparingly in the soil in which the Olive trees grow. Now this breaking up of the original trunk is probably materially aided by the extension outwards of the roots, which draw the lower portion of the trunk with them and so help to split it up. But there is still another way in which the trunks are multiplied, and which contributes in many cases to their singular appearance. From the roots which lie so thickly spread round the trunk, and which are often partly above the surface of the ground, spring up numerous shoots, some of which, being suffered to grow, attain at length the size of secondary trees; and thus one Olive tree in time often possesses several trunks. The leaves of the Olive tree are long and narrow, dark green on the upper and silvery grey on the under surface, the young shoots presenting also a silvery appearance. The leaves resemble closely those of the willow, to which indeed the whole tree bears some resemblance. It puts forth its small axillary and pretty clusters of yellowish white blossoms, usually in April; it begins to ripen its fruit about October; the berries are at first green, afterwards of a plum colour, and finally almost black, with a rich bloom; when ripe they begin to fall off the trees, and great numbers of women and children are employed in picking them up, and carrying the baskets filled with them at the end of the day to the olive mills. The picking up of the olives at San Remo sometimes extends

from November or December far into the spring, the period varying in different years according to the weather, the greater or less abundance of the crop, and the freedom of the olives from the attacks of an insect, Cynips oleæ, which lays its eggs in them and to which they are particularly liable; the eggs become hatched, and the larvæ feed on the pulp of the berry. When once the olives have fallen from the trees the sooner they are picked up the better, as if they are allowed to remain on the ground and especially if rain falls on them, they acquire a taste of earth and grass, and the quality of the oil is thereby injured. In good olive years men climb up into the trees and beat the branches with long poles, the olives falling on to cloths spread beneath the trees; the oil extracted from these olives is of the best quality, being free from all extraneous taste.

The olive crop is very uncertain, and it is reckoned that a good one is only obtained on an average once in three years, and in order even to ensure this, it is necessary that the tree should be regularly pruned and well manured. Every year the earth is dug up about them, and once in three years a trench is made running partly round the tree, but at a little distance from it; into this the manure is put. This consists of almost any description of animal and vegetable refuse, but old woollen rags are considered to be the best, and the fouler and dirtier they are the more suitable they are deemed for the purpose. The collection of these rags and their importation into the olive districts constitute a regular trade.

The trees appear at their worst after having been beaten to obtain the berries, and when they have been pruned; it is in winter that they are seen to most advantage, when the foliage is thickest and freshest; but they also look particularly well in the spring after they have put forth their new shoots and are in blossom.

The leaves of trees that are out of health from any cause are often covered with a black powder like soot; this powder consists of a fungus, dæmatium monisphyllum. It also attacks the leaves of the Orange tree.

Although the Olive is much hardier than the Orange and Lemon tree, it bearing a frost of about 15° without being killed, a warm climate, such as that of the Riviera, is yet necessary to the production and ripening of its fruit. Sparks says that it will not bear a temperature below 21° or 22° Fahr., and hence that it has during very severe winters, such as those of 1709, 1788–89, 1820, 1829, and 1839, in exposed situations suffered severely, numberless trees being killed. Thus the presence of large Olive trees in any place affords a sure testimony of the mildness of the climate. Some years since I had a small Olive tree

planted in a very sheltered position in the grounds of the Royal National Hospital for Consumption at Ventnor. It grew rapidly and blossomed freely in the spring, but I never saw more than one green olive upon it; at the end of three or four years it had attained a considerable size, although it was never manured or specially protected in any way except during very severe weather in winter.

The process of obtaining the oil is as follows, and for most of the particulars I am indebted to the kindness and practical knowledge of M. Alexandre Escoffier of San Remo. The olives are sold by the grower to the manufacturer and are carried to the mills by the women who collect them; the mills are usually situated for the sake of water power in the course of the streams which flow through the valleys. The olives are strewn on the floor, the different days' gatherings and qualities being separated by boards placed edgeways, and the sooner the olives are pressed after they are collected the better the oil. The olives are next reduced to a pulp by means of a stone, which revolves on its edge vertically on a horizontal stone, an operation which takes from 3 to 4 hours; the pulp is then taken out of the mill and put into circular bags termed 'exportins,' or sportins, having a large hole at top and bottom and made of a very tough kind of fibre worked in meshes like a net; these when filled are placed one on top of the other, to the number of 10 or 15, under a press which is almost always worked by hand. A portion of the oil escapes from the pulp before any pressure is applied, and this is called 'virgin oil;' that produced by pressure is mixed with the water naturally contained in the olive, and the expressed liquid must consequently be allowed to stand for some hours that the oil may rise to the surface; this oil is called 'huile de seconde,' and is not so good nor does it keep as well as the 'virgin oil.' It should be understood however that unless special orders from the merchants are received to the contrary, the manufacturers do not keep them separate; they are mixed together at once. After the olives are pressed the pulp is placed in large pits called 'fosses à ressences,' where it is left to be used, two, three, even six months later; or it can be immediately placed a second time in the mill, the oil to be extracted by the 'cold process,' as it is called; the mill is set going and a stream of water continuously poured on the pulp, the water and pulp being carried away by a siphon into five or six receptacles all communicating with each other. The stones of the fruit of course sink to the bottom, the pulp and any parts containing oil rise to the surface in these receptacles; this is all skimmed off and the pulp once more placed in the 'exportins,' which however are of a much closer make than those first used, and are called 'spagnolettes.' They are subjected to

pressure as before, and an oil is obtained which is used for burning and also for greasing of machinery.

In case the manufacturer prefers to wait for some months, the pulp before being put under pressure is placed in a large caldron with one-third the quantity of water and boiled for several hours; the contents of the caldron are then put into the 'spagnolettes,' which are pressed and a very thick and greasy oil procured; this after being allowed to stand for a long time divides into two qualities: the upper portion has a bad smell, is often green, very limpid, and is used for machinery and in cloth manufactories; it is more valuable than the other quality or lower portion, which is only used in the making of soap. The pulp that still remains from this last process is sold to the manufacturers of sulphuric acid, who by the aid of this and hydraulic pressure produce an oil, which in the trade is known by the name of 'sulphur oil;' soap is also made from this. The stones of the fruit are sold for fuel to heat ovens and for steam machinery.

The water from the pulp contains much of the colouring matter of the ripe olive and is stained a deep red; sometimes this is collected in receptacles to allow of the subsidence of a residue which is used as manure, or for fuel, at others it is discharged directly into the streams. 'The quantity of virgin oil yielded by 100 litres of healthy olive berries is about 12 litres on the average, and of recens oil 4 litres. The olives from the hills yield about 2 litres per 100 more oil than those from the plains. On the other hand, the olives of the plains give most fruit.' (Sparks.) The olive oil of San Remo is of excellent quality and commands a good price in the market. The olive crop is not so profitable as that of lemons and oranges, yet should the trees be once destroyed it would take generations to replace them; moreover, they are usually planted so as to allow of the cultivation, especially in the valleys, of various other trees, including the Vine, Orange, and Lemon. A destruction of Olive trees is however constantly going on in the neighbourhood of San Remo and other towns in the olive districts, either with a view to the clearance of the ground for building purposes or to the removal of old and decayed trees; even these when cut down are still very valuable, since they furnish, especially the roots, nearly all the wood used for burning, it constituting, with the exception of the small quantity of charcoal employed in cooking, the chief fuel of the country.

The wood of the Olive being somewhat hard, of a warm yellowish tint and pretty grain, is also much used for the manufacture of various kinds of ornament; some of these being beautifully inlaid.

Some persons do not admire the Olive tree, and think its

foliage sombre, and those who have only seen the smaller and scattered trees which occur between Marseilles and Cannes may well feel some degree of disappointment at the appearance which they present. The Olive tree is only found in perfection along the Riviera proper, and especially in and around San Remo and for some miles to the east and west of it. Here the trees are large, lofty, many of them very ancient and thickly planted, and extending from the verge of the sea through the valleys and up the sides of the protecting hills for miles to an elevation in some cases of nearly 2,000 feet, giving to the hills and valleys their soft, dark-green and silvery vegetation.

Any one who has seen Olive trees as they grow at San Remo, and who has wandered through the Olive groves and over the Olive-clad hills, will, I am sure, no longer regard them as sombre, monotonous, and uninteresting, but will be struck with the singular variety of forms which they present, their soft and not too obtrusive green colour, and the modified screen which they afford from glaring light, too strong sunshine, or stormy winds. Although at a distance the hills appear to be densely covered with Olive trees, yet on walking amongst them we find that there are considerable intervals between the trees, so that while they form a screen they yet admit an abundance of light, air, and sunshine. In fact they afford exactly the kind of shelter best adapted for the invalid in his walks and rambles.

The next tree to be specially noticed is the Lemon, Citrus Limonum; of this there are several species and varieties, as there are also of the Orange, and although the Citron is occasionally met with in the Riviera, it is the ordinary kind of Lemon which is there chiefly cultivated.

Although the Lemon chiefly grown in the Riviera is the common kind, in other parts of the Mediterranean the Bignetta is largely cultivated, which is said to be in every way superior to the ordinary kind. There is also a kind of lemon met with in the Riviera which is called the Sweet Lemon. Specimens of this, which I have tasted, have certainly been much less sour than the ordinary description. There are usually three principal crops of fruit in the year—one in the winter, one in the spring, and the chief one in May.

The Lemon tree is distinguished by the somewhat sparse habit of its growth, its few and straggling branches, the paucity of its light-green leaves, and by the curious fact that it blossoms nearly all the year round, even in mid-winter, and that it consequently bears fruit in all stages of development, from the scarcely formed and green condition up to the pale-yellow and ripe fruit. It is in these circumstances that we find the explanation of the fact that the Lemon is not nearly so handsome

as the Orange tree presently to be noticed. Still although not so beautiful as a rule, yet when seen in perfection and bearing a crop of ripe lemons it presents to us Northerners a sight at once novel and interesting.

The Lemon is a very delicate tree; the blossoms and leaves are injured by a very slight frost, the fruit falls off, as already stated, at 5°, and the tree is killed at about 8° or 9° of frost. The exact temperature however at which the fruit and trees are injured varies according to the state of the atmosphere as to moisture and dryness and the amount of radiation going on.

The existence therefore of Lemon trees in considerable numbers, these growing without any special protection and reaching a size only to be attained in the course of some twenty or thirty years, affords unmistakable evidence, not only of the mildness of a climate, but of its comparative uniformity from year to year.

The leaves and fruit of the Lemon are liable in summer to be attacked by an insect, Coccus adonidium, and those of the Orange by another coccus, C. hesperidum, both species being also subject to injury by the black fungus already noticed as attacking the leaves of the Olive tree.

The Lemon, unlike many of the trees which grow and flourish in the Riviera, does not bear drought, but requires frequent watering, and hence the most congenial situations for its growth are the numerous valleys, each watered by its stream, which exist around San Remo and in a limited district which may be said to be bounded on the one side by Mentone and on the other by Taggia. It is in excursions up these watered and sheltered valleys that the Lemon tree is principally met with and where it is profitably cultivated. The light green of its foliage contrasts so strongly with the softer and darker green of the Olive as to make it at once apparent that if the valleys and hills were as thickly studded with Lemon as they now are with Olive trees, the eye would quickly become fatigued with the brightness of the colouring. The growth of the Lemon is quite as dependent upon a plentiful supply of water as on the mildness of the climate and protection from frost; Lemon trees are therefore not found in many situations otherwise suitable, in consequence of the absence of a due supply of water.

Water is the great want of the Riviera, both for domestic and agricultural purposes, especially in the summer, when there is but little rain and the streams become dried up. When this occurs, the cultivators are dependent upon one or other of the following sources of supply: upon the rainfall stored in large reservoirs, on wells or on springs situated at a distance high up the mountains, and brought in small stone channels to each

principal Lemon farm. These springs are usually private property, and a very high rent is charged for the use of the water, which is allowed to flow for an hour or two once a week into the main channels supplying the orchard. The water thus received may pass into a tank for future use, or the land may at once be irrigated with it by means of the numerous small channels which are distributed with much ingenuity to all parts of the land.

In the town of San Remo a great many Lemon trees have of late been removed, and the process of removal is still continued to make room for the erection of houses, and there are not now, therefore, nearly as many trees as formerly.

The Lemon is a much more remunerative crop than the olive; the price of course varies with size and quality, but the best lemons usually fetch from 20 to 30 francs per thousand.

Lemon picking is made a speciality by men, who show their skill by selecting only such fruit as will just pass through a certain sized ring.

The difference between lemons bought in England and those which we get here freshly gathered from the tree is very great; the lemons, even when gathered green, as they very often are, are much more fragrant and pleasant to the taste than the imported lemon. Neither the cook nor the pharmaceutist could dispense with the grateful juice or fragrant oil of the peel of this most valuable and wholesome fruit.

The kindred tree upon which a few words may next be bestowed is the Orange tree. Who in his youth has not pictured to himself the beauties of an Orange grove, and longed to behold it in its loveliness!

Unlike the Lemon, the Orange tree is distinguished by the regularity of its growth, the closeness of the branches, and the abundance and density of its dark-green foliage, in which the golden fruit lies half buried and concealed. Few spectacles can exceed the beauty of a grove of large and well-grown Orange trees laden with their abundant crops of ripe golden oranges, such as are to be found during the winter in the valley of Taggia within a short distance of San Remo; as there seen the picture formed in childhood of its beauty is even surpassed.

The Orange tree blossoms once only, in the early spring, usually in the month of February, but sometimes earlier or later, the whole air in the neighbourhood of a group of trees being then perfumed with the scent. This year the trees both of Orange and Lemon were covered with blossom on the 1st of December. This is a very unusual circumstance, due, it is said, to the abundant rain. The flowers being out of season will bear but little fruit, and will of course weaken the usual crop.

The Orange tree flowers very freely, especially the kind which bears bitter fruit, and since there is usually more blossom than is necessary for fruiting, it is customary to pick off the superabundant flowers and to sell them to the perfumers; those from the bitter Orange tree have much the strongest perfume and yield the largest quantity of scent, and hence are the more valuable. 'A bitter orange tree in full bearing will give from 20 to 60 kilogrammes of flowers, while a sweet orange tree only yields from 10 to 30 kilos.' 'It is calculated that 100 kilos of fresh bitter orange flowers will give, on distillation, about 40 kilos of "eau double," and 10 of "eau simple," and from 6 to 7 decigrammes of essential oil (Neroli).'—Sparks. It of course bears but one crop of fruit, which begins to ripen and to assume its characteristic golden tint in the autumn and early winter. It is at this time that a large proportion of the oranges are gathered for sale, those intended for exportation being gathered while still somewhat green; but the quality of the fruit improves greatly by its being kept on the tree for some months longer, until April or May, or even till the autumn. It is stated that a tree in full fruit will produce as many as from 4,000 to 6,000 oranges.

The Orange tree is less delicate than the Lemon, the fruit bearing about 7° and the tree 11° of frost.

Amongst the varieties or species cultivated on the Riviera, the Bitter orange and the Mandarine, sometimes called the Tangerine, may be mentioned; this last was only introduced from China in 1828, and is now being largely grown, the fruit commanding a higher price than that of the sweet orange.

On the whole, the orange, especially if we include the several species and varieties embraced under the name, must be pronounced even a more valuable fruit to man than the lemon; what more grateful than the juice of its ripe fruit? what more agreeable preserve than that of the bitter orange? what lighter or pleasanter tonic than the infusion made from bitter orange peel? and what more acceptable perfumes than those prepared from its flowers? especially the essence or Neroly so much used in the making of Eau de Cologne.

The following very interesting account of the cultivation of the Vine is from the pen of Mr. Van Eys of San Remo; this gentleman has vineyards of his own, is practically acquainted with the manufacture of wine, and has specially studied the chemistry of the subject.

'The Vine is very generally cultivated at San Remo, but not on a large scale. The province of Porto Maurizio, to which San Remo belongs, has no more than 5,884 ettari (16,209 acres) of vineyard, with a produce of 18 ettolitri (396 gallons) per ettaro, 1,000 square metres, which is very little, considering that an

ettaro of good soil can produce from 80 to 100 and more ettolitri (2,201 gallons).

'The cultivation is, generally speaking, rather careless; but as the soil is very fertile and the vine a very strong plant, much can be done that is wrong, and much can be left undone that would be profitable, without damaging directly the results of the crop. The general carelessness is perhaps more felt in the wine itself, which is very often made in such a way that it is impossible to keep it longer than a year; in some measure the cause may be the small quantity of tannin which is found in the wine, though the principal cause must be the want of cleanliness, the wine being very often turbid.

'The vineyards are planted in close lines; they are pruned in December, and are never looked at afterwards, consequently they have a very luxuriant foliage, at the expense of the grape. There are roughly speaking six kinds of grape—two red and four white; of the red grapes, the Croirora is most appreciated, as it gives the largest quantity of wine; but the Rossese (the red one) gives certainly the best wine, and has made the reputation of the wine of Perinaldo, a small village near San Remo, of which more is sold in San Remo than Perinaldo produces. Among the white grapes the Vermentino is the best known, though the Verdapollo and Massardo are perhaps equally good; but this last is perfectly ripe only in October, and no one has ever patience to wait so long: generally the vintage beginning before the grape is ripe. The wine of San Remo and its environs is, upon the whole, a light and good wine, when well made, without the sweetish taste of the Southern, and the more heavy taste of the Piedmontese wines. When well made it reminds one of, though inferior to, the Verona wines, which are excellent, and might be compared to Bordeaux wines; of which they have the same amount of alcohol, namely, 9 and 12 per cent. Mentioning here some Italian wines, it would not be fair to consider all the Southern wines as sweet wines. The red Lacrima Christi is a fresh and good wine, more like the French red wines.

'Until now San Remo has been fortunately free from the phylloxera, though at Porto Maurizio, very near, two or three vineyards have been infested, and consequently destroyed after the adopted Italian method. Upon the whole, the cultivation of the vine is rather increasing; the uncertain crops of the Olives and Lemons have brought about this happy change.'

The Fig-tree abounds everywhere. It grows rapidly, often attains a great size, and bears freely. By its large and handsome leaves it affords in the summer a very agreeable screen from the sun. There are many different varieties, some of which ripen their fruit in the early summer; but the greater number not till

September and October; some even bear two crops in the year. In the case of the early figs, the fruit appears before the leaves, but with the late figs, the reverse occurs. The milky juice of the fig possesses acrid properties; this juice is often seen before the fig becomes over-ripe, issuing from the stalk, and if it touch the lips, as it often does, when the figs are consumed directly as gathered from the tree, it will cause them to smart and burn. The Figs of San Remo are very abundant, cheap, and good; and since they are very nutritious, they form an important item, both in the fresh and dried state, in the diet of the poor—indeed, they are very freely partaken of by all classes.

The Sea Onion, or Squill, is frequently seen growing beneath fig-trees; this is placed there in the belief that the flowers of this plant attract the insects, which would otherwise feed upon the figs themselves. However this may be, the Fig tree has many enemies. One is a very curious creature which, though it has no shell, resembles very much in form and habit the Limpet. It attaches itself very firmly to the small twigs on which it is usually found, and being a parasite, and living on the juices of the tree and fruit, it impairs greatly the vitality of the tree. Species of the same genus sometimes infest the Orange tree, doing it much mischief. Assuming more or less the colour of the tree on which they are found, and being flat and so closely attached, their presence is often overlooked.

The Japanese Medlar, Mespilus Japonica, is of common occurrence in gardens and orchards. It is an evergreen with handsome dark green foliage. It flowers freely in the winter. The flowers give forth an odour which is at once abundant, soft, and very pleasant; it ripens its yellow oval and subacid cool fruit early in the spring (see page 88). The Common Medlar, Mespilus Germanica, also grows freely in the Riviera, and the fruit of both kinds is commonly seen in the market.

Of all the trees of the Riviera there is none which imparts to the scenery so graceful and Oriental an aspect as the Date-bearing Palm, Phœnix dactylifera, with its long feathery and pendent compound leaves. This palm is beautiful in all stages and conditions. In its young state, when the plant is stemless and the leaves seem to spring directly from the ground; or when, after the lapse of many years—it may be a century—the leaves are borne high mounted on the top of long and slender stems; or lastly, when in flower, or bearing large bunches of fruit.

To see it in perfection it is necessary to go to Bordighera, but it may also be seen to great advantage in many other places and situations, as in the gardens of the Casino at Monte Carlo, the Quai des Palmiers at Nice, and in the garden of the Victoria Hotel Sat an Remo.

It is this palm which gives to Bordighera its reputation, and which constitutes its chief attraction. The trees abound everywhere, and are of all sizes and ages; the principal Palm groves lie to the east of Capo San' Ampeglio, which shelters them somewhat from the westerly winds. The Palms in these groves are very fine, some of them attaining a height of a hundred feet or even more, and being, it is stated, over a thousand years old. The effect produced is very striking, the Palms imparting to the scene an Oriental character which would be even more apparent were it not that the leaves of very many of them are gathered up and tightly bound together, whereby of course the trees are deprived of all their feathery gracefulness. The object of this proceeding is to prevent the leaves from becoming green, they being preferred colourless for some purposes, although they are used in church processions and decorations both green and blanched. Another very fine and ancient grove is on the left-hand side of the footway, leading up to the old town.

Beautiful as the Date Palm is in its ordinary state, it is still more interesting when in flower and fruit. The inflorescence consists of a bundle of fine twigs the sides of which bear at short intervals single small blossoms. At first these twigs are tightly enclosed in a hard sheath, which by their growth and expansion they manage to burst; when liberated, the twigs spread out in a brush-like form, and each small flower gradually passes or is converted into a date: thus each twig becomes bordered with dates in the manner commonly seen in freshly opened boxes of this fruit. The dates attain their full size, change from green to yellow or brown, and ultimately become ripe. When tasted, however, though sweet, they are usually found to be hard, juiceless, and almost destitute of their usual pleasant and characteristic flavour. It is only in very sheltered situations that the dates ripen so as to be edible. When the palm is in full vigour, some of the bunches of dates are really gigantic, and would weigh some two or three kilos. The same tree may bear several such branches, and in this state the tree presents a really majestic appearance.

It is generally imagined by most people that the presence of ancient Palms in great numbers in any locality affords indisputable evidence of the exceptional mildness of the climate: this is true to a certain extent only, since this, the Date-bearing Palm, would grow nearly if not quite as well in most parts of the Riviera, and particularly in such sheltered places as San Remo and Mentone; but they are not planted there to any great extent, because their cultivation would not pay, as there is but little demand for the leaves, whereas Bordighera has long had

the monopoly of the supply of palms to the churches of Rome on Palm Sunday.

Another handsome and productive tree which claims a notice, though its distribution is somewhat limited, is the Carouba, or Locust tree, Ceratonia Siliqua. By the Germans it is called Johannisbrod, or St. John's Bread, from the belief that it was on the pods or fruit of this tree that St. John the Baptist fed when in the wilderness. It thrives best on a rocky soil with full exposure to the sun, and the finest specimens of it are to be found between Villefranche and Mentone. It is a large and bold-looking evergreen tree, distinguished by its dark-green, shining, pinnate leaves. It is dicœcious, the flowers rising up directly from the bark of the smaller branches, and from the union of these with larger branches, in place of as in most cases from the axils of the leaves. It flowers in the spring, and ripens its pods and beans in the autumn: these contain not only a large proportion of nitrogen, but also much sugar, and hence they are very nourishing and fattening, and, being comparatively cheap, they are much used in the feeding of cattle. The Carouba tree is very delicate; injured by slight, and killed by severe frosts.

The Firs of the Riviera also form a very conspicuous feature in the landscape. The soil being dry, light, and sandy in many parts, the Firs find the conditions favourable to their growth. In some places they are found growing close to the water's edge, in others on the near hills, or on the more distant surrounding mountains. The principal species met with are the following:—

One of the most beautiful and singular is the Umbrella, or Stone pine, Pinus pinea. A little forest of these trees is found on the sandy plain to the west of Cannes, where they excite the attention and surprise of every passer-by. Fine specimens are met with in some other situations, as in the neighbourhood of St. Raphael. From their picturesqueness, they often form a prominent feature in sketches of Rivierean scenery.

The species of fir usually found growing on the lower hills is the Aleppo, or White Pine.

The two chief species on the mountains are the Cluster Pine, Pinus Pinaster, which furnishes the large and beautiful fir cones, 'pommes de pin,' so much used for lighting the wood fires; and the Maritime Pine, or Pinus Maritima, the cones of which are small and rounded.

More inland the Scotch Fir, Pinus Sylvestris and Pinus Cembra, are met with.

Amongst the trees deserving of special notice is the Blue Gum, or Eucalyptus Globulus, belonging to the natural order Myrtaceæ. The Eucalyptus is an evergreen, blossoming freely, and producing in abundance its curious bronze-like and urn-shaped flowers and

seed; the flowers, which are large and resemble closely those of the Myrtle, as well as the fruit, may be seen on most of the larger trees throughout the winter. The stamina are at first enclosed in the urn, the lid of which after a time falls off, allowing of their expansion. The difference of appearance presented by the young and older trees, especially in the form of the leaves, is very singular; in the young tree the leaves are light green, opposite, sessile, ovate, and coated with a bluish bloom, from which circumstance, no doubt, the familiar name of Blue Gum is derived; but the leaves of the older trees are long, stalked, twisted or scimitar-shaped, thick, and of a dark green colour. The Eucalyptus sheds its rich cinnamon-coloured and fragrant bark freely in very large pieces, which may be often seen hanging from the trees in strips. The Eucalyptus is remarkable for the large quantity of a volatile oil which it contains; this possesses a fragrant and balsamic odour and abounds in every part of the tree, the leaves emitting the odour strongly when bruised; indeed, it is evolved naturally in some cases to such an extent as to scent the air near the trees.

Now, this volatile principle is a source of ozone like the resin of the Fir tree, and it possesses powerful medicinal properties; hence the Eucalyptus Globulus in various forms is now becoming employed in medicine. A liqueur is prepared from it at Marseilles, termed Eucalypsinthe, which is extensively used in France and which is specially recommended on account of its calmative properties as a substitute for that pernicious and nerve-destroying compound, Absinthe. Specimens of Eucalypsinthe prepared by the firm above alluded to were exhibited at the Paris Exhibition; one of these I examined. It possessed strongly the odour of the Eucalyptus, and a small quantity added to water caused the mixture to become of a milky colour from the deposition of the oily and resinous matter contained in it; the flavour was however anything but agreeable, and it is difficult to understand how any one could be brought really to like it as a beverage, though they might take it as a medicine. The Eucalyptus is credited with febrifuge properties; these, some would assign to the volatile oil it contains, and to the action of this as an ozoniser, while others with more reason attribute its beneficial effects to its drying up, by the rapidity of its growth and the abundance of its evergreen foliage, the damp marshy and even malarious soil in which it is frequently planted.

Another of the more noticeable of the trees which abound and flourish so luxuriantly in San Remo and the neighbourhood is the Pepper tree, Schinus molle. This often attains considerable dimensions; there is a very large specimen in the garden of the English Chaplain, the Rev. G. L. Fenton, and this, although of the size of a forest tree, yet appears to be full of life and vigour. The Pepper tree is especially remarkable for the delicacy and elegance of its compound leaves and the large bunches of coral-

like berries. When unripe the berries are green, and it is no unusual circumstance in the autumn to see the blossom, which is comparatively small and insignificant, and the green and ripe berries together on the same tree; the berries are pungent and have very much the taste of those of ordinary pepper. In the month of October the Pepper trees are laden with their ripe berries, and are then seen in the height of their beauty.

That curious plant the Prickly Pear, Opuntia vulgaris, is made up of a series of oblong pieces or sections which are attached to each other by their extremities. The several sections resembling each other very closely in form and size, and being so united, impart to the plant a very formal and curious appearance, the arrangement reminding one of some gigantic coralline. The new sections grow from the extremities of the older ones, and it is from the distal edges of these that the blossoms spring which afterwards bear the peculiar fruit known to most English people, as it is not unfrequently seen in fruiterers' shops in London. The Prickly Pear blossoms freely in the months of May and June, and if in a favourable situation, it bears an abundant crop of fruit, which it ripens early in the winter. These 'pears' are sometimes called here 'figues des Indes' and 'poires d'épines;' one section alone often bears as many as twenty specimens of the fruit. When ripe the pears are of a bright and almost vermilion colour on the side exposed to the sun, and from their surface spring bunches of spines disposed in geometrical order. They contain a deep reddish-yellow pulp with numerous seeds; this is cool and refreshing, but the pears I have tasted possessed but little flavour. It is necessary to be very careful in handling the fruit of this cactus, not only on account of the thorns above referred to, many of which drop off before the fruit becomes ripe, but because from the spots where the larger thorns spring, there also issue innumerable hair-like prickles, which are so exceedingly minute as to escape observation and which readily pierce the skin, giving rise to a good deal of irritation.

The following quotations will form an appropriate conclusion to the foregoing description of the vegetation of the Riviera. Dr. Panizzi, in his work entitled 'San Remo e il suo Clima,' writes:—

'The vast extent of soil between San Remo and Ventimiglia is full of plants which present a true indication of our mild temperature. One may in vain search beyond these limits for such hardy specimens of the Date Palm, which, though its fruit seldom ripens here, rises proudly feathering to the height of 20 yards or more. The "Circuit of the Palm trees" was the name given at the close of the last century by the Ligurian Republic to this tract of country, which is so strikingly distinguished from the rest of Italy.' By some authors San Remo is described as

the 'Garden of the Western Liguria' or Riviera, as Nervi has been styled the 'Garden of the Eastern Riviera.'

Professor Allman, the President of the Linnæan Society, affirms:—

'Nowhere in Europe is there a vegetation which in winter and in spring basks under the rays of a more genial sun, where its mountain barriers more thoroughly defend it from the icy winds which sweep over the unprotected plains of the north; and when the season of rains is at an end, there spreads over all this sunny land an atmosphere of absolute transparency; while away upon its extreme southern boundary lie the waters of the Mediterranean, flowing round wooded crags and picturesque headlands, and gleaming with an intensity of blue approached by that only of the cloudless sky which stretches over all.'

It has thus been shown that the Vegetable kingdom affords abundant evidences of the mildness of the climate of the Riviera, especially its more sheltered portions, as San Remo and Mentone. But the Animal kingdom likewise furnishes proofs of the same fact, only that these are less patent and not so generally known.

Thus evidences are furnished by the Feathered tribe. But on this point I will cite the authority of an accomplished ornithologist, Signor Benedetto Musso, of Alassio, whose valuable ornithological collection will be found more particularly referred to in the account given of Laigueglia and Alassio in my work on 'San Remo and the Western Riviera.' He states that, of the kinds of Birds which are stationary in the Western Riviera during the spring, summer, and autumn, there is not one which leaves in the winter, and that this suffices to show that they can find but very little difference between the winter and the other seasons: that the Martin, Hirundo urbica; the common Swallow, H. rustica; and the Crag or Rock Swallow, H. rupestris, which are on the passage in spring, and which remain until the autumn, are seen in some parts of the Western Riviera to prolong their stay throughout the whole winter: that in winter, and particularly on the colder days when snow falls on the Alps, the Apennines, and even in Corsica and Sardinia, and most frequently in the last case, although these countries are situated much further south, we see an immense quantity of Birds arrive here, either of the kinds which are stationary or of those seen only on the passage in spring and autumn, the latter having returned hastily to our Riviera to enjoy our mild climate. Among these pilgrims, which come to us in search of warmth, and which at certain periods cover the country in vast numbers, may be mentioned the following: the Redbreast, Sylvia rubicola; the Wren, Sylvia troglodytes; the Alpine Warbler, Accentor alpinus; the Warbler, A. modularis; the Stonechat Warbler, Saxicola rubicola; the White

Wagtail, Motacilla alba; Grey Wagtail, M. boarula; the Redwing Thrush, Turdis iliacus; the Fieldfare Thrush, T. pilaris; the Song Thrush, T. musicus; the Missel Thrush, T. viscivorus; the Ring Thrushel, T. torquatus; the Blackbird, T. merula; the Solitary Thrush, T. cyanus; the Wood Lark, Alauda arborea; the Skylark, A. arvensis; the Crested Lark, A. cristata; the Cirl Bunting, Emberiza cirlus; the great Titmouse, Parus major; the Lorrain Bunting; E. Cia; the yellow Bunting, E. citrinella; the Goldfinch, Fringilla carduelis; the Chaffinch, F. cœlebs; the Linnet, F. cannabina; the Bramble Finch, F. montifringilla; the Grunling, F. chloris; the Bullfinch Grosbeak, Pyrrhula vulgaris.

Notwithstanding that the Birds above enumerated are described as pilgrims, yet it must be understood that many of them, as the Finches, are also stationary and build their nests there, in the Riviera. Although many birds are driven to the Riviera in winter by stress of weather, it is in the spring and autumn that they arrive there in the greatest numbers; at the former season they are on their way to their summer quarters, which lie far northwards, and in the autumn to their winter habitations, which are much further south than the Riviera. In the summer, birds are comparatively scarce; this arises from the fact that they can then obtain only a limited supply of water and food, owing to the warmth of the climate and the comparative absence of rain during that season. Among remarkable birds of passage met with near the coast are the Golden Oriole, the Huppoo, some handsome Woodpeckers, and the Bee-eater.

Although there is a close season for native birds, the law does not afford the slightest protection to birds of passage; the consequence of this is they are ruthlessly shot down immediately they alight on the coast, often hungry and exhausted by their long flight, and under the plea of shooting birds of passage the native birds are often slaughtered as well. It is true that shopkeepers are forbidden under a penalty to sell native birds during the close season, but this regulation is constantly evaded.

The number of men who carry guns, in every town and village along the Riviera, must be very great indeed, for they may be encountered in troops nearly everywhere. Each man pays 15 lire a year for his licence, and it is in this payment that the reason is found for the tolerance of a practice which, as carried out here, is both barbarous and unwise. No wonder that insect life abounds to the injury and loss of the agriculturist.

Other proofs of mildness of climate are afforded by Fish; many of the Mediterranean kinds resembling those of tropical seas in the beauty and brilliancy of their colours. Some of those often seen in the market are of a deep blue, vivid green, or bright scarlet; others are marked with stripes of vermilion or gold, and

some are variegated, presenting all the colours of the rainbow. (For a list of the chief fish brought to the San Remo market see page 34.)

The extraordinary depth of the Mediterranean serves to modify in a very singular manner the structure of some of the fish which inhabit it. Those fish which live in deep water, where light only partially penetrates, are remarkable for the large size of their eyes, while those which are found only at the greatest depths, which scarcely a ray of light reaches, have eyes very imperfectly developed, thus affording a striking example of adaptation to particular ends. The fish which inhabit the deeper water have need of eyes which enable them to utilise the limited light that is there found, while those which live in darkness have but little need of eyes at all.

But few Marine Shells are found at San Remo, or I believe along any part of the coast of the Western Riviera. The kinds met with nearly all make their way into the market and are regarded as edible; the names of these are given elsewhere. Through the kindness of Colonel Cox, however, I am enabled to give a list of the Land and Fresh Water shells collected by him in 1882 in the neighbourhood of San Remo.

Land and Fresh Water Shells found at San Remo, or in its Vicinity, 1882.

Order	Species	Locality where found
Bulimus	Acicula	Under dead leaves, moss, in fissures of bark and rocks
,,	Detritus	Under dead leaves, on limestone rocks
,,	Decollatus	On grassy banks, under stones, San Remo
,,	Folliculus	Under stones and dead leaves, San Remo
,,	Montanus	On woody mountains, under moss and dead leaves
,,	Obscurus	
,,	Quadridens	Under stones and leaves, in clefts of rocks
Bythinia	Tentaculata	In ponds, streams, mouth of the Adina
Clausilia	Bidens	Bordighera at foot of olive roots
,,	Nigricans	On moss on olive trees, San Remo
,,	Punctata	Monte Bignone, on moss at Giandola
,,	Rolphii	On the Roya River
,,	Solida	On bark of trees in shady spots
,,	Ventricosa	Under moss and bark of old trees
Cyclostoma	Elegans	Abundant everywhere at San Remo
,,	Septemspirale	
,,	Acuta	On herbage on the seashore
Helix	Aperta	At foot of old walls, San Remo
,,	Arbustarum	

Land and Fresh Water Shells—continued.

Order	Species	Locality where found
Helix	Aspersa	Common everywhere
,,	Bulimoides	Abundant at Ventimiglia, on swampy ground
,,	Carthusiana	In San Martino Valley
,,	Canliana	,, ,, near flour mills
,,	Cespitum	Everywhere about San Remo
,,	Cinitella	San Martino Valley, above flour mills
,,	Ciliala	Under dead leaves
,,	Conspersata	San Martino Valley, among old ruins
,,	Explanala	
,,	Fœtans	In damp places under dead leaves
,,	Incarnata	Giandola, on the Roya River
,,	Lapuida	
,,	Nemoralis	Abundant everywhere
,,	Niciensis	Bordighera
,,	Obvoluta	Old flour mills, San Martino Valley
,,	Pisana	Taggia, Bordighera Station, common
,,	Pomatium	Ventimiglia
,,	Pulchella	
,,	Serpentina	
,,	Substriaca	
,,	Terverii	
,,	Terrestris	Common
,,	Trochoides	,,
,,	Unifasciata	,,
,,	Variabilis	,,
,,	Vermiulata	,,
Lymnea	Auricularis	Taggia, in stagnant water
,,	Peregra	,, ,,
,,	Palustris	,, ,,
Planorbis	Contortus	,, ,,
Pupa	Avenacea	
,,	Dolium	
,,	Granum	
,,	Multidentata	At the foot of coarse grass
,,	Perversa	
,,	Numquedentata	On old walls
,,	Subcylindrica	
,,	Umbellicata	
Zonites	Algirus	Common in olive groves, San Remo
,,	Cundidissimus	Common everywhere
,,	Celarius	Beyond old flour mill, San Martino Valley
,,	Diaphanus	,, ,, ,,
,,	Lucidus	,, ,, ,,

For the following very interesting particulars in reference to the fossil shells found in the Pleiocene at Bordighera and other places in the neighbourhood I am much indebted to Mr. Good-

child. The genera, as will be seen, are numerous, but the species amount to some hundreds.

'I enclose a list of the genera represented amongst our Pleiocene fossils. The large genus Pleurotoma is the most numerously represented as regards species (about sixteen varieties if I remember rightly), and the Pectens are the most plentiful, though only of five or six species. Amongst the Pectens is the extinct Pecten latissimus, which bears the same relation to Pecten maximus, largest of living Pectens, as a heavy stoneware dish does to a Japanese eggshell saucer. The very small genus, Trochotropis, is present in one extinct species; this shell, which is also found at Asti, is catalogued in the Museum at Geneva as Cancellaria umbilicata, but though it presents a superficial resemblance to a Cancellaria the mere presence of an umbilicus in such a shell is sufficient to relegate it to its true genus. A unique find of an exceedingly small and perfect Imperator was found interesting by Dr. Woodward, who had never seen so small a specimen of that genus, and thought it might belong to a new species. Many of the Conidæ and Naticæ retain traces of their coloured markings, whilst the nacre of the Trochi, Pinnæ, and others is still brilliant. The beds in which these fossils are found are of a similar character to those which extend southwards along both slopes of the Apennines throughout Italy and terminate in Sicily; according to Lyell these beds are progressively more modern as they extend south, and represent the sea-bottom where the Mediterranean was shallowed by estuaries at the time of the latest upheavals of the Apennine range. On this coast the upheaval, which is very slight near Genoa, rises to three or four hundred feet near Albenga, and to about twelve hundred where it culminates at Ventimiglia; beyond Nice it sinks again, being about six hundred near Cannes, and ends, I believe, at the Esterels. The chief beds of the series on the northern slope are so far as I know about Asti. They are evidently of the same date, so that the upheaval took place when the valley of the Po and its tributaries was still a continuation of the Adriatic. The clay, which is a fine bluish earth suitable for potters' work, is often washed into fantastic spires, precipices, or caverns by the heavy rains; and I advise those who explore the beds to be cautious in doing so. They exist in the Borghetto, Vallecrosia, Nervia, Roya, and Latti Valleys, and in two intermediate ravines. The Latti deposit is far the most extensive, though not, I think, the richest.

'*List of Genera.*—Univalves: Strombus, Aporrhais, Murex, Typhis, Ranella, Triton, Pisania, Trophon, Fasciolaria (?), Latirus, Cancellaria, Pyrula, Fusus, Buccinum, Terebræ, Nassa, Ringicula, Purpura, Trochotropis, Columbella, Cassidaria, Cassis, Oliva, Ancillaria, Conus, Pleurotoma, Voluta, Mitra, Cypræa, Erato,

Natica, Chemnitzia, Enlima, Arithium, Turritella, Proto, Vermetus, Scalaria, Solarium, Rissoa, Phorus, Turbo, Imperator, Trochus, Emarquinla, Calyptræa, Pileopsis, Patella, Dentalium, Bulla, Acera.

'Bivalves: Terebratula, Ostræa, Anomia, Plaumonica, Placuna, Pecten, Lima, Spondylus, Plicatula, Pinnu, Arca, Pectunculus, Limopsis, Uncula, Seda, Yoldia, Chuma, Cardium, Lucina, Corbis, Astarte, Cardita, Venus, Cytherea, Mactra, Tellina, Donax, Solen, Corbula.'

There are, I believe, but three localities in the neighbourhood of San Remo where fossil shells are found, namely, in the sand-pit below the Madonna de la Costa, on the road leading to San Bartolomeo, and at Bussana.

The class of Reptiles affords equally striking evidence of mildness. In England and other countries with a similar climate, most of the members of this class lie concealed during the winter months in a state of torpor or hybernation, but here they retain, especially the Lizards, their wonted agility, the walls and banks when the sun is shining being literally alive with them. It is very amusing to watch the Lizards; in the winter they do not stray far from their homes, usually holes or fissures in rocks or walls to which they immediately retreat on the approach of any one, but as the spring advances and insect life becomes more abundant, many of them forsake their winter haunts altogether and are often to be seen on the trunks and branches of trees, or on the leaves of plants, searching or lying in wait for their food, which consists almost entirely of insects. In the tribe of Reptiles are some curious species not met with in England. I must not omit to mention the pretty green Tree Frog, the croaking of which in the spring, in damp places and near water, sometimes persistently carried on through the night, is something really astounding, and quite sufficient to put sleep to flight.

The Rev. G. L. Fenton placed in my hands a considerable time since the MSS. of an article by his son, the late Mr. George F. Fenton, M.R.C.S., containing a list with detailed descriptions of the Amphibia and Reptilia found in San Remo and the neighbourhood. He devoted much time to their study, of which he was particularly fond, and kept many of the species for a long time, in order to make himself thoroughly acquainted with their habits. The list is both interesting and valuable, and I am glad to have the opportunity of now making it known.

The Amphibia include Toads, Frogs, Newts, Tritons and Salamanders, the Reptilia Snakes and Lizards.

BUFO VULGARIS, Toad.

Common in most of the torrents early in spring; it frequents the deeper holes under shelving rocks; found as high as San Romolo. Perhaps it is

most abundant in the 'Foce torrent,' as that is most free from the ejecta of the oil-mills at that period. They leave the water after they have deposited their spawn; which consist of long double strings of black ova arranged in a single row, and enveloped in a transparent albuminous material (frogs, on the other hand, deposit theirs in a mass). The males are usually the first to appear, and the last to leave the water. The colouring of the upper surface is usually brownish in the females, and olive in the males (but the hue varies in the same individuals according to circumstances), with irregular lighter patches on back and sides; the under surface of both is usually of a dirty-white or yellowish. The large gland at the sides of the head is marked by a broad black stripe, and there is generally a black mark on each side of chest. They feed on insects, worms, &c. They shed their skin at uncertain periods, and always swallow it. This toad is very much larger than the common English toad; when fully grown it has a length of some 6 or 7 inches.

Bufo viridis, Green Toad.

I have not found this species at San Remo, but it probably does occur here; these toads are not uncommon, however, in the torrents near the sea, and stagnant pools of water and ditches, at Bordighera and Ventimiglia. They breed about the beginning of April; the males at such times give utterance to a beautifully clear, bell-like note, 'trilled' forth, and rising towards its termination, not unlike a distant railway whistle if that were rolled. It is dark-grey, ashy, or olive above, with numerous large, irregular-shaped green spots; white below with a few black spots; the irides are lemon-coloured. The length of the body is usually from $2\frac{1}{2}$ to 3 inches. This species is sometimes called the Natter-Jack.

Hyla viridis vel. H. arborea, Common Tree-Frog.

Met with everywhere where there is water, as high as San Romolo. They are usually of a bright uniform green above, but this often varies, in the same individual, from an almost cream-colour, through shades of blue, to a very dark olive; they may, however, be spotted or blotched with various shades of brown, grey, ash, olive, or violet, &c., which marks are at times liable to become invisible. The male alone possesses a vocal sac; and when full grown, can be distinguished by the yellow colour of the throat and the corrugations of the skin over it. The toes are provided with dilated extremities, by the aid of which they are able to climb the smoothest vertical surface. They will live well many years under confinement; feed on insects, and always require moisture. They shed their skin at variable intervals, and generally swallow it. Full grown specimens attain a length of from 1 to 2 inches. They breed in tanks in April, when they can at least be heard, if not seen; they will answer to any sound at all like their own.

Pelodytes punctatus, Spotted Pelodyte.

This batrachian is about the size of an ordinary tree-frog, but rather more slenderly made; it can, however, be at once distinguished by the presence of the numerous small warts on the upper surface of the body; the two species are frequently found in company in tanks and wells. They breed twice in the year, and the tadpoles from the autumn brood pass the winter in that state, and are the first of all the class to leave the water in spring; and all tadpoles found here in the winter months will probably belong to this species. They are of a dark-grey or tawny, or ash above, spotted with green, white below; the males acquire rough black spots on the breast and fore-legs, and some of the toes, in the breeding season. Is widely distributed,

nowhere very abundant, prefers hilly places; found at San Romolo, Bordighera, &c.

(N.B.—This is, I believe, the first record of its occurrence in *Italy*; it is usually considered to be confined to France.)

BOMBINATOR IGNEUS, 'Fire-bellied Toad.'

I have not found this species myself; but from accounts given, I have little doubt it occurs up at San Romolo. Prefers hilly and mountainous districts. Is toad-like in appearance, with upper parts of body covered with warts. The length of body scarcely more than an inch. It is olive-brown above, and orange or rose-coloured beneath, more or less spotted with bluish-black.

ORDER URODELA. Newts, Salamanders, &c.

One or more species of newts occur at San Romolo, but I have not been able to procure any in their perfect state for identification; and one species at least, of salamander is also to be found there, viz. Salamandra maculosa, black, spotted with yellow. But it is not common, and I have not seen it.

CLASS REPTILIA (SNAKES, &C.)

COLUBER ÆSCULAPII, Æsculapian Snake.

Not very common here, at least during the season; nor does it appear to attain any considerable size. I have not seen any much over 3 feet, and mostly are under that; does not seem to frequent the hills, but keeps chiefly to the lower cultivated districts. It is probably crepuscular in its habits, and that may account for its not being so frequently seen; it feeds on mice. Is a very harmless snake, never attempting to bite. Is very slender for its length, the head being of an elongated or oblong form. Above it is of a light yellowish-brown colour, not unlike dried and polished olive-wood, with two indistinct longitudinal dusky stripes along each side, and frequently with small whitish spots on them; and also two light triangular spots on each side of neck; the under surface is of a pale Naples yellow, without any spots or marks whatever. It is not easy to mistake this snake for any other here.

CORONELLA GIRONDICA.

This is perhaps the handsomest of all the snakes found here; it is the one most frequently seen in the vicinity of houses, and in gardens; grows to a length of about 2 feet. Is of a grey colour above, with two faint dusky stripes along each side, and is marked with dark, obliquely transverse spots down centre of back; there is an oblique black line from behind eye to angle of mouth; the lower surface is lemon yellow, with a row of quadrilateral black spots on each side; the sides of body have a pink or rosy hue. From the scales being quite smooth, the surface of the body has a highly polished appearance. It is also to be found in hilly localities, and seems to prefer the drier parts; is met with up to San Romolo. Very gentle snake, lives well in confinement, and feeds on lizards, geckos, and probably mice. It is pretty common, judging from the number of killed ones that are to be met with, lying about the roads, especially after the spring rains.

TROPIDONOTUS NATRIX, VAR SICULUS, Ringed Snake.

This is of the same species as the common snake of England, but differs from it in its colouring, and is the only variety found here; the difference *seems to* be brought about by a total absence of yellow pigment in this

variety; thus, the upper surface is grey, instead of an olive green; the yellow ring round the neck, so characteristic of the English snake, is either entirely absent, or imperfectly replaced by a whitish one; the lower surface is white without any yellowish tinge, and the irides, which are usually of a light brownish colour in the former, are of a dark grey in the latter. The longitudinal series of alternate black spots along back and side, and the large alternate black ones on the under surface, are the same in both. It grows much larger here than in England; I kept one for some time that was 4 ft. 4 in. in length, and it no doubt sometimes exceeds even this; the one mentioned lived entirely on toads, but this is not usual—they mostly keep to the various species of frogs. They are found along the banks of the torrents, and never far from water—occur also at San Romolo. Are not very common, give forth a strong and peculiar odour when alarmed. The female, as among all snakes and most reptiles, grows to a much larger size than the male.

TROPIDONOTUS VIPERINUS, Viperine Snake.

Always found near water, and is common in most of the torrents after April; when alarmed it immediately takes to the water, usually diving to the bottom, where it can remain a very considerable time without coming up to breathe. I have never seen any over 2 feet in length, and they are usually about 18 inches. The general colouring of the upper surface is grey or brownish with a greenish tinge, there is a dark zig-zag mark down centre of back, sometimes interrupted, and dark spots with lighter centres along the sides; the under surface is white or of a brownish-yellow, with numerous black spots arranged in a sort of cheque pattern. It feeds on tadpoles, aquatic insects, and frogs. I have seen one catch and devour a small eel.

(N.B.—This species is not very unlike the viper in its general appearance, and even possesses a more or less perfect V on its head; but the fact of it always being found in or near water is almost sufficient in itself to prevent its being mistaken for the more dreaded reptile.)

CALOPELTIS LACERTINA, Lacertine, or Lizard-eating Snake.

This is the largest of the snakes found here, sometimes attaining a length of 5 feet; it is besides very fierce, biting and hissing readily if provoked, but of course is only capable of drawing a little blood. It frequents the dry, uncultivated, and wilder localities on the hills, and lives in the holes and crevices of the stone terrace walls; it probably feeds on mice and birds, as there are few lizards to be found in such places; the younger individuals sometimes are found at a lower level, and probably come to procure lizards, slow-worms, &c., which are more suited to their size. They never live long in confinement, and never become tame. The whole of the upper surface is of a *dark*-green or greenish-brown colour, with a few more or less distinct black spots along the back; there is a greyish stripe along each side of the body; and in all I have met with here, there has been a large irregular black patch near the neck, extending two-thirds round the body. The lower surface is yellow and may or may not be marked or spotted with black. This species may be recognised at once, by having the scales of the body hollowed out in their centre, like a spoon—no other European snake has this character.

Note.—This concludes the list of all the non-venomous snakes I have ever seen or heard of at San Remo. Of the venomous class, I have little doubt that one species at least is to be found here; in which case it would probably be Vipera Aspis; but it must be extremely rare, as I have searched for it in vain in the most suitable places. If it really does not

occur, all I can say is, 'the more's the pity.' Vipers are chiefly nocturnal reptiles, living on mice, though they are often to be met with in the daytime basking in the sun, but on such occasions are very inert, and only too glad to make their escape. It is impossible to give any certain means of distinguishing between the harmless and venomous kinds, *at sight*, to the inexperienced; the shape of the head proves nothing, and the V-mark even is present in a harmless species; on a closer inspection the presence of fangs, and the fact that the upper surface of the head is covered with numerous small scales, similar to those on the body, in place of large, broad, regularly-deposited plates, will at once put the matter at rest. Vipers prefer dry, rocky, or sandy localities away from water. The authentic cases of a fatal result from the bite of a viper, in a previously healthy subject, are extremely few on the Continent, and entirely wanting in Great Britain; but any ordinary enthusiast will certainly not stop to contemplate any such remote possibility, but proceed at once, on discovering such a prize (in the words of Tom Hood), to

> Take it up tenderly,
> Lift it with care,
> Fashioned so slenderly,
> . . . . and so rare.

LACERTA OCELLATA, Eyed Lizard.

Is the largest of its genus; it grows here nearly, if not quite, to a length of 2 feet. I have had one in my possession of 21 inches, but the tail occupies about two-thirds of this. It lives among the terraces up in the hills, in the driest and sunniest situations; subsisting on insects of various kinds, the praying mantis and locust are among its favourites. It is less shy than the near-related green lizard, and turns to defend itself when pushed to extremities. It lives well in confinement, and is capable of being tamed to a certain extent. The colouring of the adult is green above, with large blue spots on the flanks and greenish-yellow beneath; the young is marked with transverse rows of round yellow spots. This species can at once be distinguished from the next, by having ten longitudinal rows of scales on the abdomen, and not six as in the Common Green Lizard.

There are still other species to be described, but the MSS. containing the full description of these is unfortunately missing. One of these is the beautiful green Lizard, Lacerta viridis; this is nearly a foot in length, and is usually found under stones in the beds of torrents; it is quite harmless and becomes very tame in confinement.

Another species is the Hemadactylus Verruculatus, or Gecko; this inhabits holes in walls, its body is flat and covered with warts, but it is principally distinguished by a double series of transverse plates beneath the feet, and by the toes on each foot being provided with nails. It is perfectly harmless.

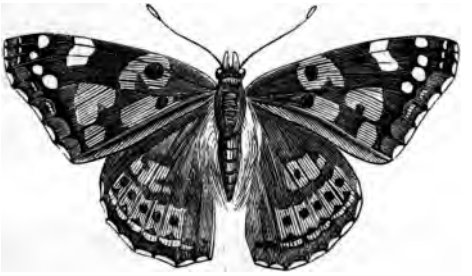
Then there is the small and graceful, but common Lizard, Platydactylus muralis, sometimes called Lacerta muralis, and which is seen everywhere on walls. The body is usually brownish, smooth, and the form very graceful, but it is specially distinguished by having a single series of plates beneath the toes—the second and third toes of each foot only being provided with nails.

The last species is the well-known Anguis fragillis, or slow-

worm ; in this the legs are not apparent, the scales are smooth and the general form of the body resembles that of a snake.

The smaller lizards live principally on flies and other insects. There are no land or fresh-water Tortoises to be found at San Remo or in the neighbourhood.

FIG. 15.



VANESSA CARDUI.

The Insect tribe abounds throughout the winter. As many kinds of flowers, which in a less favourable climate are annuals, here become perennial, so the lives of some insects would appear to be prolonged. Indeed, it seems that the death of some

FIG. 16.

VANESSA ATALANTA.

butterflies in the winter in the Riviera is due not so much to fixed limit of age or severity of weather, as to the failure at that season of the supply of flowers on which they are accustomed to feed. The same remark applies to the ordinary House-Fly, the detestable Mosquito, and some other insects. Even during the winter of 1878–79, so remarkable for its severity, butterflies

were to be seen in great numbers on every sunshiny day. Up to the middle of October they were much more numerous here than they are in the summer in England, and to the end of November they were still abundant. During December and January the kinds chiefly met with were the Painted Lady, Vanessa Cardui (Fig. 15), the Red Admiral, Vanessa Atalanta (Fig. 16), and the Humming Bird Hawk Moth, or Macroglossa stellatarum; but the Clouded Yellow, Colias edusa and Speckled Wood, Pyrarga Ægeria, were also found until late in the winter. At the end of February the new year's butterflies began to appear,

FIG. 17.

PAPILIO PODALIRIUS.

the first noticed being the small Garden White, Pieris Rapæ; the large Garden White, Pieris Brassicæ; the Pale Clouded Yellow, Colias hyale, and the beautiful pale yellow or brimstone-coloured species, Rhodocera Rhamni; later on, the still more handsome Swallow Tails, Papilio Podalirius (Fig. 17), P. Machaon (Fig. 18), and many others made their appearance, and by the beginning of April butterflies were seen in great numbers, particularly the Painted Lady. For a further notice of this species the reader is referred to the description of the Valley of Ceriana.

Moths are still more numerous than butterflies, and these *embrace* a great variety of species, including the gigantic Night-

flying Peacock, the Death's Head Moth, and many large Sphinxes and species of Deilephila.

When I left England in the middle of October 1878 there was scarcely a butterfly to be found, but as soon as the Riviera was approached countless numbers were seen from the windows of the railway carriages; the rush of air created by the passage of the train rendering them partly unable to control their flight, they were carried along as though they were pieces of coloured paper. On quitting San Remo at the end of April butterflies were swarming everywhere, but on reaching England again, scarcely a single specimen was anywhere to be met with.

The specific names of many butterflies are derived from

FIG. 18.

PAPILIO MACHAON.

certain plants, and the reason of this is curious; they themselves do not feed upon these plants, but instinct teaches them to select those upon which to deposit their eggs best adapted for the food of the young caterpillars. Thus, not to go beyond the species already mentioned, the large Garden White derives its scientific or Latin name, Pieris Brassicæ, from depositing its eggs upon the cabbage; the Painted Lady, Pyrameis Cardui, from laying hers on the Thistle; and the Brimstone, Rhodocera Rhamni, from selecting for its eggs a species of Buckthorn; and so on.

But not only may evidence be gathered of the unusual mildness of the climate from the comparative longevity of butterflies, and the non-hybernation of certain kinds, but likewise from the

fact that species of butterflies and other insects are met with unknown to colder latitudes. On this point the following remarks by Dr. Onetti may now be quoted:—

'If, as we have said above, the vegetation and the kinds of plants afford incontestable proof of the mildness of our climate, the presence of certain insects peculiar to warm climates will furnish another palpable demonstration of the same fact. As evidence we would adduce, among the Lepidoptera, Poliommatus ballas: Charaxes Jasius; Amphipyra effusa; Polia cantaneri; amongst the Coleoptera, Epomis circumscriptus; Ateuchus sacer; Cimelia muricata; Coniatus tamarixi; Lampiris Italica; and among the Orthoptera, Bacillus granulatus, &c.'

Dr. Coulon of Monaco who has specially studied the Lepidoptera of the Riviera has kindly given me the names of the following species as indicative of a southern temperature: Charaxes Jasius; Deilephila Livornica; D. Nerii; and Ophiodes Tirrhæa.

There are few more elegant and pleasing studies in the whole range of Natural History, and a study, moreover, of much utility, than that of the Lepidoptera, an order which includes butterflies and moths. The study of the former, since they are chiefly diurnal in their habits, is best suited to those who are delicate. Moths, on the other hand, are for the most part nocturnal, and must, therefore, be captured and studied at night. The pleasure of this pursuit lies not so much in the observation of a class of insects remarkable for the elegance and grace of their form and movements, and the wonderful beauty and harmony of their colouring, as in the fact that in the search for some of the rarer species one is led to visit and revisit in the free air and bright sunshine many lovely spots in valleys and on mountains which would otherwise remain unseen and untrodden by us.

The Lepidoptera, as is of course well known, are oviparous; from the egg comes the caterpillar, from this the chrysalis, in which the several parts, which combined, form the moth or butterfly, as the case may be, are at first faintly foreshadowed, and then gradually completed, until at length the perfect insect emerges from its narrow prison house, and that very wonderful transformation is effected from a creeping thing, destined to crawl on the earth, to the bright-winged denizen of the air.

The Lepidoptera should be studied in each of the three stages of their lives, as caterpillars, chrysalides, and winged insects: in each of these conditions they present characters of great interest, and the knowledge of the one state often affords much help to the study of the other.

*Cater*pillars are great epicures, and are most particular what *they eat; unlike* man they are not omnivorous, and their diet is

usually confined to the leaves of a very small number of plants; in very many cases to those of one particular kind of plant, a somewhat singular fact. Some few caterpillars, however, live exclusively on grain or seeds, attacking them even in the pods; others bore into the stems and trunks of trees, and live on the wood or pith; others, again, feed on a variety of fruits, as apples, pears, plums, &c.; while lastly, the wool and silk of our garments, and even the feathers of our beds, are liable to be infested with caterpillars. The particular food of any caterpillar being known—and this information is usually readily obtainable either from books or by noticing the plant upon which the caterpillar is caught—it is an easy matter to keep them alive, and to rear them until they undergo their great change into chrysalides; these may also be readily preserved until the perfect insect emerges in its full beauty. A very simple and convenient way of rearing caterpillars, which by the way are often remarkable for beauty and delicacy of colouring, and hence form excellent subjects for the pencil and brush of the amateur artist, is to place a sprig or branch of the plant on which they feed in a flower-pot filled with earth, to put the caterpillar on this and to enclose the branch in a piece of muslin fastened below. All that is afterwards required is the renewal of the food from time to time. Caterpillars grow very fast and quickly attain their full size; as soon as they reach this, they cease to feed, become usually very restless, and evidently seek for a suitable place wherein to undergo their transformation. The locality chosen varies greatly in the case of the different orders and species of Lepidoptera. They soon lose their brilliancy of colour, diminish in size, and seem really to be ill at ease. The caterpillars of most butterflies spin cocoons more or less perfect, which are placed in various situations, sometimes exposed to the weather, in others placed under sheltering walls, eaves, &c., and secured in position by threads of silk. On the other hand, the caterpillars of many moths bury themselves in the earth in readiness for their change; these usually forming much less perfect cocoons. There would appear to be several reasons why the cocoons exposed to air should be more perfect than those in the ground; one is that the chrysalides, if not furnished with a reasonably secure dwelling, would be much exposed to the attacks of their enemies; another is that the compact cocoon or covering helps to retain within the chrysalis the moisture necessary to the carrying on of its vital functions. Buried in the earth, the chrysalis is less liable to attack or to perish from exsiccation. When the caterpillar is evidently about to undergo its transformation, it should be placed in a suitable box, one section of which should contain some fine sandy earth; the caterpillar can then make its

selection between air and earth, and remain either above or below ground. When the caterpillars bury themselves in the earth they should not be disturbed for two or three weeks; indeed, they may be allowed to remain thus interred until the chrysalides become hatched. When regular cocoons are formed these may be placed in a box containing sufficient bran or fine sawdust to cover them, the box being put in a cool and not over dry room. If kept in a hot place many kinds will dry up, and thus become killed. When the butterfly or moth has come forth it may be either at once preserved, when it will of course be in a much more perfect state as regards its plumage than when caught in a net; or if there be several of the same kind they may be kept for the sake of the eggs. The period during which the chrysalis state lasts varies greatly; in cold countries it usually continues in the case of butterflies throughout the winter, but in warm climates and with some species there may be two broods of butterflies in the season. In the case of the Emperor Moth, the chrysalis condition may endure from six months to three years, as I am informed.

I would now point out the best and most humane method of killing butterflies and moths intended for preservation. This is the least pleasant part of the subject, and I would remark that young children should not be allowed to kill these insects at all; neither should those of more mature years do so, unless they have the intention of really studying the ways and habits of these creatures, and to make a useful and instructive collection. The mere passing excitement of the moment to catch, kill, and possess, is not a sufficient justification. There is a great difference in the vitality of butterflies and moths. Some of the smaller kinds die quickly, literally in a few moments; while others, usually the larger and more vigorous sorts, are much more tenacious of life. The best reagent to use is cyanide of potassium. A wide-mouthed bottle, holding about thirty ounces, and furnished with a screw top or lid or even a well-fitting bung, is selected; in this a quarter of an ounce of the cyanide, dissolved in the smallest quantity of water possible, is first placed, and then a paste of plaster of Paris, sufficient to cover the bottom of the bottle, and form a deposit of about an inch in thickness. The plaster will become hard in the course of a few minutes, and the bottle when wiped clean on the inside will be ready for use. Care being taken to keep the top on, the cyanide will not require to be renewed for some months. The butterflies should be allowed to remain in the bottle for two hours or more, and it is better not to spread them out till the next day, as at first they are very stiff, and the operation is by no means an easy one. Chloroform is sometimes used, but it is less certain in its action,

and it stiffens too much. Sulphide of carbon is also occasionally employed, and is, I believe, effectual; it has, however, a very unpleasant smell. With a view to permanent preservation by the destruction of parasites, perhaps the very best substance is carbolic acid. It is sufficient to place three or four small round pieces of cotton wool well steeped in the strongest solution of the acid in each box; these should be supported on pins, and the solution renewed two or three times a year. Besides the butterfly net, which should be very light and portable, two or three cork-lined boxes, a few pieces or sheets of thin cork or pith of agave, and about a dozen 'etaloirs' of different sizes for spreading out the wings of the insects, are necessary. In the best cabinets the butterflies are all high mounted; that is to say, they are raised about an inch and a half above the bottom of the box on the long pins, by which the insects are supported.

I have said that butterflies are diurnal in their habits, but that the majority of moths are nocturnal; the same may be affirmed in a general way of their respective caterpillars, those destined to become moths forsaking their shelter at the close of day and feeding only at night. Of this habit the Processional Caterpillar, to be shortly described, affords a remarkable example. The caterpillars of moths as well as these last are to be obtained chiefly at night, and special proceedings have to be resorted to for their capture. Although moths are night flyers they are greatly attracted by a bright light, as that of a lamp; this may be placed in a room with an open window, or, still better, under trees and backed up by a white sheet. The lamp should be visited from time to time, and any moths flying about or settled on the sheet secured. Moths are also much attracted by saccharine substances; and hence has arisen the practice of smearing about a square foot of the bark of several trees with a mixture of sugar or treacle and beer.

The following is a list of the principal Lepidoptera met with in the gardens, valleys, hills, and mountains of the Western Riviera. This list includes most of the larger and more conspicuous kinds, as well as some of the rarer species, very many of which are to be found in and around San Remo. For this catalogue I am indebted to the great kindness of M. Pierre Millière, of Cannes, a very distinguished authority and writer on the Lepidoptera.

Butterflies.

Papilio Podalirius, *Linné*, Chenille sur Prunellier.
„ Machaon, *L.*, Ch. sur les Ombellifères.
Thais var. Cassandra, *Hb.*, Ch. sur Aristolochia rotunda.
„ Rumina, *L.*, Ch. sur Aristolochia Pistolochia.
Leuconea Cratægi, *L.*, Ch. sur les Rosacées.
Pieris Brassicæ, *L.*, Ch. sur les Crucifères.

Pieris Rapæ, *L.*, Ch. sur les Crucifères.
,, Napi, *L.*, ,, ,,
Anthocharis Daplidice, *Hb.* Ch. sur Résédacées.
,, Tagis, *Hb.*, Ch. sur Iberis pinnata.
,, Cardamines, *Hb.*, Ch. sur plusieurs Crucifères.
,, Eupheno, *L.* (Aurore de Provence), Ch. sur Biscutella didyma.
Leucophasia Sinapis, *Fab.*, Ch. sur Lotus et Vicia.
Colias Hyale, *L.*, Ch. sur les Coronilla.
,, Edusa, *F.*, ,, ,,
Rhodocera Cleopatra, *L.*, Ch. sur Rhamnus alaternus.
Thecla V. Album, *Kn.*, Ch. sur les Ulmus.
,, Ilicis, *Esp.*, Ch. sur Quercus Ilex.
Polyommatus Ballus, *Fab.*, Ch. sur Lotus hispidus.
,, Phlæas, *L.*, Ch. sur les Rumex.
Lycæna Telicanus, *Hb.*, Ch. sur les Erica et Genista.
,, Argus, *God.*, Ch. sur Légumineuses sous-ligneuses.
,, Battus, *God.*, Ch. sur plusieurs espèces de Sedum.
,, Corydon, *Hb.*, Ch. sur Trifolium, Lotus, &c.
,, Argiolus, *L.*, Ch. sur Légumineuses.
,, Sebrus, *Hb.*, Ch. (?)
,, Melanops, *Bdv.*, Ch. sur Dorycnium suffruticosum.
,, Euphemus, *Hb.*, Ch. (?).
Libythæa Celtis, *Esp.*, Ch. sur Celtis australis.
Charaxes Jasius, *God.*, Ch. sur Arbutus Unedo.
Limenitis Camilla, *Schiff.*, Ch. sur Chèvrefeuille des bois.
Vanessa Polychloros, *L*, Ch. sur Ulmus.
,, Io, *L.*, Ch. sur les Orties, le Houblon.
,, Cardui, *L.*, Ch. sur tous les Carduus.
,, C. album, *L.*, Ch. sur le Houblon.
,, Antiopa, *L.*, Ch. sur les Saules.
,, Atalanta, *L.*, Ch. sur Parietaria officinalis.
Melitæa Didyma, *Esp.*, Ch. sur plusieurs espèces de Violettes.
Argynnis Latonia, *L.*, sur Viola canina.
,, Adippe, *God.*, Ch. sur Viola esterelensis.
Melanargia Psyche, *Hb.*, Ch. sur Graminées.
Satyrus Alcyone, *Dup.*, Ch. sur Graminées.
,, Fidia, *L.* ,, ,,
,, Phædra, *L.* ,, ,,
Pararga Ægeria, *L.* ,, ,,
Epinephile Pasiphæ, *Esp.* ,, ,,

Moths.

Syrichtus Malvæ, *L.*, Ch. sur Fragaria vesca.
Acherontia Atropos, *L.*, Ch. sur Datura Stramonium.
Sphinx Pinastri, *L.*, Ch. sur Pinus halepensis.
,, Convoluli, *Esp.*, Ch. sur Liserons.
Deilephila Euphorbiæ, *God.*, Ch. sur Euphorbia Characias.
,, Nicæa, *Prun.*, Ch. sur Euphorbia nicæensis.
,, Livornica, *Esp.*, Ch. sur Rumex et Linaria.
,, Elpenor, *L.*, Ch. sur les Epilobes et sur la Vigne.
,, Nerii, *God.*, Ch. sur le Nerium.
Smerinthus Ocellata, *L.*, Ch. sur les Saules.
,, Quercus, *Schiff.*
,, Populi, *L.*, Ch. sur les Peupliers.
Pterogon *Œnotheræ*, *L.*, Ch. sur Epilobium aquaticum et angustifolium.

Macroglossa Stellatarum, *L.*, Ch. sur les Rubiacées.
„ Fuciformis, Ch. sur Chèvrefeuille.
Sesia Uroceriformis, *Tr.*, Ch. ronge les Racines du Cistus monspeliensis.
Thyris Fenestrella, *Scop.*, Ch. sur Prunus spinosa.
Zygæna Minos, *Bdv.*, Ch. sur Thymus vulgaris.
„ Trifolii, *Esp.*, Ch. sur Lotus et Hippocrepis.
„ Transalpina, *Esp.*, Ch. (?).
„ Rhadamanthus, *Bdv.*, Ch. sur Dorycnium.
„ Ononidis, *Mill.*, Ch. sur Ononis spinosa.
„ Occitanica, *Bdv.*, Ch. sur Dorycnium.
Lithosia Quadra, *L.*, Ch. sur les Lichens.
Emydia Grammitica, *L.*, Ch. sur Graminées.
Deiopeia Pulchella, *L.*, Ch. sur les Borraginées.
Euchelia Jacobeæ, *L.*, Ch. sur Senecio.
Callimorpha Hera, *God.*, Ch. sur plantes basses.
Chelonia Villica, L., „ „
„ Fasciata, *Esp.* „ „
„ Hebe, *L.* „ „
„ Pudica. *L.*, Ch. sur Graminées.
„ Casta, *Esp.*, Ch. sur Asperula cynanchica.
Spilosoma Fuliginosa, *L*, sur plantes herbacées.
„ Lubricipeda, *God.*, Ch. polyphage.
Cossus Lignipenda, Ch. dans les troncs d'arbres.
Hypopta Cæstrum, *Hb.*, Ch. (?)
Zeuzera Æsculi, *L.*, Ch. dans les tiges d'arbres fruitiers.
Demas Coryli, *L.*, Ch. sur Noisetier.
Liparis Dispar, *L.*, Ch. sur un grand nombre d'arbres.
Cnethocampa Pytyocampa, *G.*, Ch. sur les Pins.
Bambyn Canensis, *Mill.*, Ch. (?).
„ Dorycnii, *Mill.*, Ch. sur Dorycnium.
„ Franconica, S. V. (Var. A.), *Mill.*, Ch. sur Euphorbia spinosa.
„ Rubi, *L.*, Ch. sur plantes basses.
Lasiocampa Pini, *God.*, Ch. sur Pin d'Alep.
„ Pruni, *L.*, Ch. sur les arbres fruitiers.
„ Quercifolia, *L.*, Ch. sur Aubépine.
„ Suberifolia, *Rbr.*, Ch. sur Quercus Suber.
Saturnia Pyri, *God.*, Ch. sur Poirier, Erable, &c.
„ Carpini, *God.*, Ch. sur Dorycnium, Prunus spinosa, &c.
Cilix Spinula, *Dup.*, Ch. sur Prunus spinosa.
Psyche Albida, *Bdv.*, Ch. sur Graminées.
„ Silphella, *Mill.*, Ch. sur Dorycnium et Thymus.
Nola Thymula, *Mill.*, Ch. sur Thymus vulgaris.
„ Darduinella, *Mill.*, Ch. sur Graminées.
Bryophila Glandifera, *Dup.*, Ch. sur Lichens.
„ „ var. Liguris, *Mill.*, Ch. sur Lichens.
„ Oxybiensis, *Mill.*, Ch. sur Lichens.
Acronycta Auricoma, *Dup.*, Ch. sur Bruyère.
Synia Musculosa, *Hb.*, Ch. (?)
Heliophobus Hirta, *Hb.*, Ch. sur Graminées.
„ Hispida, *Bdv.*, „ „
Episema Trimacula, *Bdv.* „ „
Mamestra Immunda, *Evers.*, Ch. sur Atriplex Halimus.
Cucullia Anthemidis, *Gn.*, Ch. sur Aster acris.
Mamestra Maura, *L.*, Ch. sur Lierre.
Spintherops Spectrum, *Esp.*, Ch. sur Genista juncea.

Ophiodes Tirrhæa, *Cramer*, Ch. sur Lentisque, Myrte, &c.
Catocala Optata, *God.*, Ch. sur les Salix.
„ Elocata, *Esp.*, Ch. sur Peuplier.
„ Nymphagoga, *Esp.*, Ch. sur Chênes verts.
Plusia Chalcites, *Esp.*, Ch. sur les Cytises.
„ Gamma, *Esp.*, Ch. sur les Cytises, Solanum, &c.
Eupithecia Rosmarinata, *Mill.*, Ch. sur Romarins.
„ Mnemosynata, *Mill.*, Ch. sur les Cyprès.

For the following list of butterflies and moths found in San Remo and the immediate neighbourhood I am much indebted to Mr. John Congreve. It will be observed that the list contains some of the species included in the general list of M. Millière.

Butterflies.

Papilio Podalirius, scarce Swallowtail.
„ Machaon, Swallowtail.
Thais Hypermnestra, ?
Leucophasia Sinapis, wood white.
Leuconea Cratægi, *L.*, black-veined white.
Pieris Brassicæ, large white.
„ Rapæ, small white.
„ Ergane, „ (small species.)
„ Napi, green-veined white.
Anthocharis Daplidice, Bath white.
„ Cardamines, orange-tip.
„ Eupheno, „ (foreign variety).
Colias Hyale, pale-clouded yellow.
„ Edusa, clouded yellow.
Rhodocera Rhamni, brimstone.
Vanessa Atalanta, Red Admiral.
„ Antiopa, Camberwell Beauty.
„ C. album, Comma.
„ Cardui, Painted Lady.
Melitæa Cinxia.
„ Didyma.
„ Athalia.
Argynnis Euphrosyne, all Fritillaries.
„ Selene.
„ Amathusia.
„ Adippe.
„ Aglaia.
„ Latonia.
„ Paphia, silver washed.[1]
Limenitis Camilla.
„ Sibylla, White Admiral.
Satyrus Circe. } Unknown in England.
„ Hermione. } Unknown in England.
„ Alcyone. } Unknown in England.
„ Briseis. } Unknown in England.
Arge Galathea, marbled white.
Pararge Megæra, wall brown.
„ Egeria, Argus.
Epinephele Hyperanthus.
„ Janira, meadow brown.
„ Tithonius, large heath.
Lycæna Euphemus.
„ Argiolus.
„ Corydon, chalk-hill blue.
„ Argus.
Polyommatus Phlæas, small copper.

Moths.

Acherontia Atropos, Death's Head.
Sphinx Pinastri, Pine Hawk.
„ Convolvuli, Convolvulus Hawk.
Deilephila Galii.
„ Elpenor.
Smerinthus Tiliæ.
„ Ocellata.
Macroglossa Stellatarum.
„ Fusiformis.
Zygæna Filipendulæ.
Zygæna Minos.
„ Carniolica.
„ Lavandulæ.
Deiopeia Pulchella.
Callimorpha Hera.
Chelonia Villica.
Spilosoma Fuliginosa.
Liparis Dispar.
Oreopsyche Muscella ?
Saturnia Pyri.

[1] I have found some very fine specimens of a very dark, almost black, Fritillary, much resembling Argynnis Paphia.

Lasiocampa Quercifolia.
,, Bombyx Quercus.
,, Pruni.
Pygæra Bucephala.
Acronycta Psi.
Tryphæna Comes.
,, Pronuba.
Broolomia Meticulosa.
Mania Maura.
Plusia Chalcites.
,, Gamma.
Acontia Luctuosa.
Catocala Electa.
Ophiusa Algira.
Ophiodes Tirrhæa.
Venilia Macularia.
Eubolia Bipunctaria.
Camptogramma Bilineata.

The subjoined list has been kindly furnished me by Mr. Crump, who has been so fortunate as to capture a specimen of that rare, beautiful, and tropical butterfly, Charaxes Jasius.

Butterflies.

Papilio Podalirius.
,, Machaon.
Thais Rumina.
Pieris Daplidice.
,, Napi.
,, Rapæ.
,, Brassicæ.
Anthocharis Cardamines.
Rhodocera Rhamni.
Colias Hyale.
,, Edusa.
Vanessa Atalanta.
,, Antiopa.
,, Io.
,, Urticæ.
,, Egea.
,, Cardui.
Melitæa Aurinia.
,, Aurelia (?)
Argynnis Selene.
,, Niobe.
,, Adippe.
,, Aglaia.
,, Latonia.
Argynnis Paphia.
Limenitis Sibylla.
Charaxes Jasius.
Satyrus Circe.
,, Semele.
Arge Galatea.
Satyrus Megæra.
,, Macera (?)
Lycæna Corydon.
,, Argus.
,, Telicanus.
,, Bætica.
,, Ægon.
,, Minima.
Polyommatus Phlæas.
Thecla Betulæ.
,, Quercus.
Syrichtus Malvæ.
Thamnos Tages.
Cyclopides Palæmon.
Hesperia Comma.
,, Sylvanus.
,, Thaumas.

Moths.

Sphinx Pinastri.
,, Convolvuli.
Deilephila Euphorbiæ.
,, Nicæa.
,, Celerio.
,, Elpenor.
,, Porcellus.
Deilephila Nerii.
Smerinthus Tiliæ.
,, Populi.
,, Ocellata.
Macroglossa Stellatarum.
Acherontia Atropos.
Saturnia Pyri.

Many of the above are sufficiently distinct to be recognisable either when settled or on the wing, so that it is not necessary to their identification that they should be captured. In considering the question of the suffering involved in the killing of specimens for the Cabinet the fact should not be forgotten that a wholesale

destruction of these creatures is constantly in progress, from the operation of natural causes or law, and that the number killed by the collector or student forms but an infinitesimal part of the whole. Further, it should be remembered that the collection and study of the Lepidoptera may be followed up not only as a pleasing and elegant pursuit and pastime, but also as one involving practical results of very great importance. Of many butterflies and moths it cannot, I fear, be affirmed that they are useful to man, while unfortunately some few are positively hurtful. Although not useful in a direct and obvious sense, they are so in another way: they may be compared to aërial and flying flowers; and, like flowers in general, they minister by the beauty of their forms and colouring to man's pleasure and delight, and surely this is a purpose high and great enough for them to serve in the economy of nature, and one which should claim for them an immunity from all wanton destruction.

Those who wish to follow out the study of the Lepidoptera should obtain the work of Monsieur M. E. Berce, published by Deyrolle, la Rue de la Monnaie, Paris. It is in six volumes, the first of which only treats of Butterflies, and the other five of Moths. It is illustrated by many coloured engravings, and the price of the entire work is 55 francs.

The five species, the figures of which follow, are all of frequent occurrence in the Riviera, although the first two have not yet, I believe, been seen at San Remo.

FIG. 19.

PARNASSUS APOLLO.

I will close this part of my subject with a few remarks relative to the 'Processional Caterpillar,' Bombyx processionaria.

The Fir trees, in many parts of the Riviera, as at Cannes, Villefranche, and San Remo, are infested in some cases to such *an extent* with this Caterpillar as to become greatly injured or

even destroyed. The history of this Caterpillar, so far as I have ascertained, is as follows: The Moth deposits its eggs in suitable situations on branches of the Fir tree; these in due course become hatched, and the Caterpillars begin to spin for themselves a nest round a small branch, the size of the nest varying con-

FIG. 20.

SATYRUS CIRCE.

siderably according to the number of the caterpillars, some being as large as good sized birds'-nests, hanging as it were on the tree. On examining these nests attentively, no apertures serving as means of entrance and exit can usually be perceived. I broke

FIG. 21.

VANESSA URTICÆ.

off a branch of a Fir tree, with one of the nests upon it, and planted it in a large flower pot. Inspecting it on several occasions during the daytime, I was much surprised never to see any caterpillars outside the nest, and concluded that they were all stowed away in their little habitation. It happened, however,

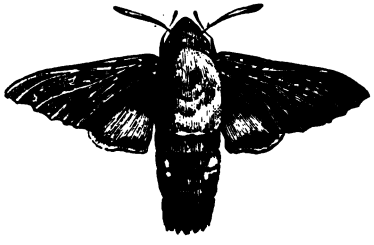
that one of my visits was paid to the nest at night, and then I was not a little astonished to find that the twigs of the fir were swarming with caterpillars; the following morning they were invisible, but the next night they were again seen busily feeding; the same thing was afterwards observed to occur regularly each day and night. This observation served to make apparent much

FIG. 22.

VANESSA COMMA.

that was otherwise inexplicable; the parents of the caterpillars being nocturnal moths, flying and feeding by night, the caterpillars themselves inherit as far as is compatible with their condition the instincts and habits of their progenitors; hence they too are nocturnal. This circumstance and their possession of nests explain the extraordinary numbers of these caterpillars;

FIG. 23.



MACROGLOSSA STELLARUM.

were they not provided with nests in which to take refuge, and were they to feed in the daytime, they would become the prey to the attacks of birds and other enemies, and their numbers would be speedily diminished.

The word 'Processional' is derived from the fact that on quitting the nest the caterpillars move away from it in a long line or procession, following one behind the other with the greatest precision. When arrived at maturity they leave their

protecting nest for the purpose of seeking some dry and sandy soil in which they can bury themselves and undergo their transformation into the chrysalis state. The instinct to march in procession is doubtless inherited, and it is often evinced at a very early period in the life and growth of the caterpillars. If they are much disturbed in their nest, although they may not have attained half their full size, they will quit it in procession, either leaving the tree entirely on which the nest is placed, or going to some other branch on which they will sometimes form a second nest, usually far less complete than the first.

I brought home early in January the small nest to which reference has been made; continued to watch it and to supply the caterpillars with fresh branches of fir until the end of April. Soon after the nest was brought home the caterpillars seemed to get very uneasy: some of them formed a procession and escaped altogether; the others deserted the nest and wandered for some days over the branches of the fir, but after a time they formed themselves each morning into a dense ball-like mass, as no doubt they are accustomed to do when in the nest, probably for the sake of warmth. Ultimately they became more reconciled to their position, and at length constructed a second nest, to which they retired early each morning.

Near the end of April, the caterpillars were observed to cease feeding and to form themselves in line, as if preparing for their pilgrimage, and gradually they disappeared from sight, until one only was left. I now searched in the soil which had been specially prepared for them, and found in it a number of the cocoons.

The Processional Caterpillar is usually credited with poisonous properties, but this idea is erroneous; handling them undoubtedly gives rise to a troublesome and persistent irritation, but this is due to the exceedingly fine and sharp hairs with which their bodies are covered; the irritation is, in fact, of the same kind, and is due to the same cause, as that arising from touching the fruit of the Prickly Pear.

The Cicada, or Cigale, belongs to the order Hemoptera. There are three species found in the Riviera; they are, according to Monsieur Heilmann, the Curator of the Library and Museum of the Hôtel de Ville at Cannes, to whom I am greatly indebted for much interesting information, Cicada plebeia, the largest species; C. orin, of intermediate size and somewhat common; and C. atra, which is the smallest and rather rare. They abound particularly on the branches of Olive trees. 'The species are distinguished by the head being short, broad and transverse, with three ocelli set in a triangle on the back of the head, and two very large and prominent compound eyes' (Wood). The

male insect is furnished with a musical apparatus which acts like a kettledrum, and which is placed on the basal ring of the abdomen, beneath the wings, it producing a loud and penetrating sound (Packard).

M. Salier, in a memoir inserted in the 'Annales de la Société Entomologique of France,' states that its song is very loud and piercing, and seems to consist of one single note repeated with rapidity, which insensibly grows weaker after a certain time, and terminates in a kind of whistle, which can be partially imitated by pronouncing the two consonants 'st,' and which resembles the sound of the air coming out of a little opening in a compressed bladder. When the Cicada sings it moves its abdomen violently, in such a manner as alternately to move it away from, and to bring it nearer to, the little covers of the sonorous cavities; to this movement is added a slight trembling of the mesothorax. The insect is often to be attracted by a careful imitation of its song. The song is very shrill, sharp and discordant, and is mentioned by Virgil and Plato. According to Messrs. Figuier and Wood, the Male Cicada is provided with an organ, not of song, but of stridulation or screeching, which is very rudimentary in the female. This apparatus is called the 'drum,' which is placed on the under side of the thorax, and is covered with a horny plate that can mostly be seen from the upper surface of the insects. The noise is caused by the plate, or rather pair of plates, being rendered alternately concave and convex by the action of powerful muscles attached to them. The noise of the Male Cicada may be heard, so Wood states, at the distance of a mile.

The Female Cicada does not sing. 'The Cicada, which always exposes itself to the most scorching rays of the sun, is not found in temperate or cold regions. The consequence is that the southern nations know it well, whilst in the north the large grasshopper, which is so common in those regions, and whose song closely resembles that of the Cicada, is commonly taken for it' (Figuier). The Female Cicada is provided with an auger, with which she makes holes in the bark of trees, in which to lay her eggs.

It is not often that visitors to the Riviera have the opportunity of hearing the song of the Cicada, as it does not appear until the hot days of summer have commenced.

Amongst the Coleoptera several very interesting species occur. One of these is the Fire-Fly, Luciola Italica Linn.

But few visitors to the Riviera ever see the species of Fire-Fly which at certain times there abounds. This beetle has a red thorax and a brown elctra, and is about half an inch in *length.* There are numerous examples of the family Elateridæ,

the best known of which is Pyrophorus noctilucus, the Fire-Fly of the Tropics, and most of which when placed on their backs possess the power of springing to their legs again. One reason why these Italian fire-flies are not seen is that the majority of people usually leave the Riviera before these insects make their appearance, and another is that they are only met in it in certain places and localities. In the spring of 1882 they appeared at San Remo as early as April 19, but ordinarily they are not met with till May. This year, 1883, they were not seen till May 21. They occur also at Monte Carlo, Vence, and Grasse, but strange to say not at Cannes.

There are few things more pleasing to behold than the graceful and darting flight of any considerable number of fire-flies under the Olive trees or in our flower gardens. They fly as if in search of some object by a series of short flights or spurts as it were; and with each jerk, which projects them through the air with augmented rapidity, the phosphorus-like light is seen to stream out afresh with increased brilliancy.

Both the male and female Italian fire-fly are luminous, but the latter less so than the former, and it is also wingless. In the case of the Italian fire-fly the light proceeds from one of the segments of the hinder part of the body, distinguished by its white colour; but in the fire-fly of the tropics, Pyrophorus noctilucus, the light is emitted from two spots on the under surface of the thorax, as also from a spot on the ventral surface between its first segment and the metathorax; this is covered with a thin membrane, and glows with an orange coloured light, 'concealed, however, when the abdomen is relaxed by the overlapping of the metathorax' (Wood). So deeply seated in the thorax is the light that the insect seems as if on fire, and so vivid is it that one may read by it at a short distance off. So bright and beautiful is the light emitted by the tropical fire-flies that Mexican and Cuban women are in the habit of ornamenting their dresses and hair with them, the insects being secured in little lace bags.

Fig. 24.

ATEUCHUS SACER.

Another highly interesting beetle found in San Remo and elsewhere in the Riviera is Scarabæus, or Ateuchus sacer, the Sacred Beetle of the Egyptians (Fig. 24). It is 'black in colour and furnished with a quantity of dense brownish hair, to which the earth clings so firmly that I have hardly seen a specimen which had not its downy coat clogged with soil. The head is very flat

and shovel like, and is cut into deep notches, so that it seems to be surrounded with spikes. The tibiæ of the fore-legs are furnished on their outer edges with four long and powerful teeth; and when the beetle assumes an attitude of which it is very fond, *i.e.* placing its four legs on either side of its head, the whole front of the insect looks like a flat spiky wheel.' (Wood.)

'The species of the genus Ateuchus collect portions of excrement, which they make up into balls, and roll until they are as perfectly rounded as pills, and in which they lay their eggs. Their hind legs seem to be particularly adapted for this operation of rolling, for they are very long and somewhat distinct from the other legs, which give to the Ateuchi a strange appearance, and make it hard work for them to walk.' (Figuier.) Turning her back upon the ball and grasping it with the hind legs, she works backwards, pushing the ball along, much as a horse backs a cart, and proceeds on her travels in search of a spot in which she can burrow.

The ball is several times larger than the beetle, somewhere about the size of a pigeon's egg. It has recently been shown that it does not contain eggs, but consists entirely of dung. When a suitable locality has been found the beetle buries itself and the ball and feeds upon it in safety. Later on it excavates a chamber in the ground which it lines with fine dung, and it is in this it lays its eggs. (See 'Souvenirs Entomologiques,' M. Fabre, Paris.)

I am indebted to Colonel Cox for several fine specimens of this beetle, which is of frequent occurrence at San Remo.

Several other species of Ateuchus are found in the Riviera, for a specimen of one of these, A. semipunctatus, I am indebted to Monsieur Heilmann. It is common at Cannes, and seems to replace the true kind, which it much resembles.

A very beautiful Ateuchus, of a golden-green colour, is met with in Egypt, A. Egyptiacum.

Another Coleopterous insect of great beauty and medical interest is the Spanish Fly, or Blister Beetle, Cantharis vesicatoria. The elytra are of a bright green colour, and light up brilliantly in the rays of the sun. These beetles often collect in great numbers in summer on the leaves of the ash, lilac, and privet, 'and are brushed off by persons carefully masked and received into linen cloths; they are killed by plunging into boiling vinegar, and then dried.' (Dr. Garrod.)

The Musk Beetle, Aromia Moschata, is also said to occur near San Remo. It is described as a lovely insect, of elegant shape, and of a soft green colour, sometimes glossed with blue, gold, copper, or bronze. It exhales a pleasant odour, resembling *musk; it also* emits a sound rather like the squeak of a bat.

Under the name of Grasshoppers, or Saltatoria, may be included three distinct families—Crickets, Grasshoppers, and Locusts. The Mantidæ may also, in unscientific language, be called Grasshoppers, to which indeed they are nearly related.

The family of Grasshoppers is particularly abundant, and some of the forms are very curious and interesting. Amongst those which attract special attention is a very large grass-green species, Acrida or Locusta viridissima; a still larger species, of a dull or olive-green colour, often seen flying about in our gardens from shrub to shrub and tree to tree, is really the locust which ravages the countries of Asia and Africa; the scientific name of this is Oedipoda migratoria (Acridium testaricum?). It is a very stupid creature, and does not know in the least how to take care of itself. If it alights on a path it will almost let you tread upon it, and it makes but little effort to escape when you attempt its capture. On the hills to the north-west of Cannes is a species closely resembling the above, which makes in its flight a noise like the rattling of dry bones. I do not know the name of this, or whether even it is a distinct species. Then there are several kinds of Grasshoppers which possess brilliantly coloured wings—crimson, blue, or yellow. In some situations, as in some of the valleys of the Maritime Alps, these coloured species are so abundant that they fly up from the grass or pathway at almost every step taken, the sudden and unexpected expansion of the coloured wings forming a pleasant surprise. In the valley of Thorenc, about thirty miles from Cannes, these and other grasshoppers so abound that the grass seems literally alive with them. Among the species found at Thorenc are Oedipoda cœrulens, O. cœrulescens, O. germanica A, and O. germanica B, the latter variety being special to the south. (Heilmann.) But many other species belonging to the same genus are found in the mountain valleys of the Alpes Maritimes.

Allied to Grasshoppers are the several species of the genus Mantis, and of which at least two kinds are found in San Remo and elsewhere on the Riviera. The most singular species is the Praying Mantis, M. religiosa, sometimes named M. viridis, from the vivid green it occasionally assumes (Fig. 25). In France this Mantis is known by the name of Prie-Dieu; this name has been bestowed upon it, in consequence of the strange attitude assumed by the Mantis, and which is well represented in the figure. The creature, poising itself on four long slender legs, placed almost at right angles, raises its front legs or arms up in an attitude of prayer or supplication, and this striking position it rigidly maintains for a considerable time—the long slender neck, surmounted by a triangular head, being at the same time outstretched. The Mantis, however, is far from praying, and is closely on the watch

all the time for its prey; for it is really a cruel and rapacious creature, seizing and feeding on live insects, flies, &c., and even on its own kindred. From its colour and motionless attitude the unwary fly is led to approach it without apprehension; but when it comes within reach it is either at once seized by the Mantis with its strong and armed claws, and immediately devoured, or before being seized it is struck down by a blow sudden and quick as lightning. I kept two of these creatures for a few days under a glass shade, feeding them with flies. Immediately they were put together the smaller of the two manifested considerable alarm, tried to escape, and then laid down on its side as though dead. After awhile they were seen facing each other, with arms raised and heads erect

FIG. 25.

PRAYING MANTIS.

in the manner peculiar to them, closely watching each other, and it soon became evident that a combat was imminent. I did not wait to see this, but the next morning I found that the smaller Mantis had disappeared, and on close scrutiny it became apparent that all the soft parts of the body had been eaten, the hard legs and the wings, all disjointed, alone remaining.

In its young state the Mantis is wingless, and the body and legs very slender: its appearance and attitude when in this stage are even more singular. The triangular head is furnished with prominent eyes and long slender antennæ. In one species, Mantis pauperata, the antennæ resemble horns, and the aspect of the *creature* is truly Satanic. The female Mantis deposits a con*siderable* number of eggs, often on stones and in agglutinated

masses of an oval form, about half an inch long. Another creature closely allied to the Mantis is the Bacillus granulatus; this is of considerable size, and very slender, the body and legs being long and stalklike. It is even more curious in its appearance than the Mantis, the wingless stage of which it somewhat resembles. It is found only in very mild climates.

Crickets likewise abound in many places, including the field cricket and the singular species about to be described.

While staying at the Château St. Michel, Cannes, my attention was called to this creature after dark one evening in May. On visiting the spot, I heard a loud shrill mechanical kind of noise; this continued for several minutes, without interruption, then it would stop for a few seconds, to be again quickly resumed. Altogether the noise was very remarkable, and it reminded me strongly of a galvanic battery in action. In the neighbourhood of the noise, which could be heard at a considerable distance, the air was thrown into vibrations which were strong enough to considerably affect the tympanum. At first I had no idea of the cause of this singular noise. On the following evening the same noise was heard at the same spot and hour. As I was stooping down, listening to it and trying to define the exact spot from which it proceeded, I saw a dark-looking object about two inches in length on the gravel path, evidently making its way quickly to the spot whence the noise proceeded. It at once occurred to me that possibly this might be the female of the creature producing the sound, and I quickly pounced upon it. On examination it turned out to be a species of Grillus, I believe identical with Grillotalpa vulgaris. Three or four evenings afterwards the same sound was heard even louder than before; and on this occasion, after the removal of some flowers, I ascertained that the noise proceeded from a hole in the ground, at the bottom of which some shining object was discernible. This I proceeded to dig out, and soon a creature, resembling that before described, but somewhat smaller, was revealed and secured.

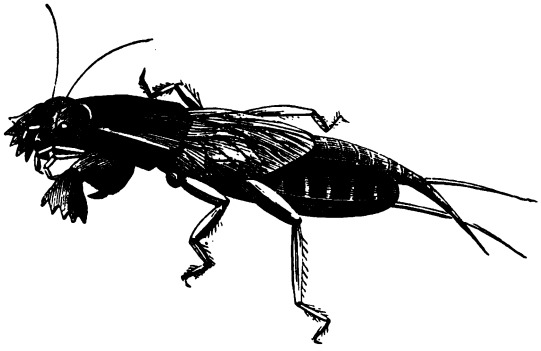
The next day both were placed on some mould in two separate flower-pots; the moment the female touched the earth it began, with its strong mole-like claws, to dig its way into it, disappearing from view in a second or two. The male rested quietly till I touched him, when he showed fight, and made a noise like a cricket, and indeed the Grillotalpa is closely allied to the cricket, and resembles it in its ways. It makes for itself and dwells in holes in the earth; these terminate in chambers, in which the eggs are deposited and hatched, the young and the parents dwelling together for a time. The common and very appropriate name for this creature is the Mole Cricket (Fig. 26), it resembling the mole not only in its habits, but in the peculiar shape

and extraordinary power of its claws or arms, as shown in the figure.

Again, the Hymenoptera have innumerable representatives. This order includes, amongst others, the Ichneumons, Bees, Wasps, and Ants—all remarkable for their high intelligence. Various species of Ichneumons are found in the Riviera—these are parasitic insects; they resemble wasps in their general appearance, with the striking difference that their bodies in the typical species are of an ovoid form, that is to say, egg-shaped. They deposit their eggs in the bodies of other insects, where they in due course become hatched, the larvæ living on the juices of their victims.

There are several species belonging to the genus Xylocopa, and all equally deserving the name of Carpenter Bee. The species found in Middle and Southern Europe, and which is extremely common

FIG. 26.



MOLE CRICKET.

at San Remo, and no doubt elsewhere in the Riviera, is X. Violacea, so named from the deep violet colour or tint of the wings, which are sometimes almost black, with a purple hue. This bee has derived its name from the fact of its boring channels or cylindrical tunnels in the wood, in which it deposits and seals up its eggs; these tunnels always follow the direction of the grain of the wood, except at the entrance. They are from a foot to a foot and a half in length, and run in opposite directions from the opening; sometimes there are other galleries above the first, all diverging from the same opening. Each tunnel is divided into ten or twelve compartments, by means of partitions, which the bee erects at equal distances with particles of the detached wood-fibre. The eggs are then deposited in these compartments.

The Carpenter Bee, X. Violacea, is found commonly in gardens, *making her* nest in the espaliers or vine props, and occasionally

in the garden seats and window shutters. It is a large and handsome species, its movements being bold and active; the body is round, shining, and almost black. It is to be seen on nearly every fine day.

Owing to the mildness and dryness of the climate and the consequent abundance of food, Ants abound during the greater part of the year, and are to be seen almost everywhere—on the mountain side, in the olive terraces, in gardens, and often near houses and under paved paths or stone steps.

The family of Ants, Formicidæ, is divided into three tribes: Formicineæ, Ponerineæ, and Myrmecineæ; the first two are distinguished by having but a single node on the petiole or stalk, which unites the thorax with the abdomen, while the third division is known by the stalk possessing two joints and two nodes or protuberances. Ponerineæ is further characterised by a contraction in the abdomen not found in the other tribes. It is to the third of these divisions—Myrmecineæ—that the Harvesting Ants belong, and which are next to be treated of. These distinctions aid greatly the identification of the species met with, and all of which belong to the first and third tribes, no representative of the second tribe having as yet been found in the Riviera.

Each nest or colony of ants consists of a queen, winged male and female ants, and wingless working ants, with of course larvæ in the nests at times.

From time immemorial ants have not only been credited with great industry, perseverance, and intelligence, but also with much prudence and forethought, as evidenced by their storing up grain and seeds of different kinds in specially constructed granaries, these stores being destined for consumption in times of scarcity. This habit is thus referred to in the Book of Proverbs: 'Go to the ant, thou sluggard; consider her ways, and be wise: which having no guide, overseer, or ruler, provideth her meat in the summer, and gathereth her food in the harvest.' Again, Virgil in the 'Æneid,' as translated by Dryden, thus graphically describes their proceedings:

> Thus in battalions march embodied ants,
> Fearful of winter and of future wants,
> T' invade the corn, and to their cells convey
> The plundered forage of their yellow prey.
> The sable troops, along the narrow tracks
> Scarce bear the weighty burden on their backs;
> Some set their shoulders to the ponderous grain;
> Some guard the spoil, some lash the lagging train:
> All ply their several tasks, and equal toil sustain.

Many other ancient writers and authorities might be named, all bearing testimony to the existence of the habit in question and

in ways so conclusive, that it is difficult to understand how it has come about that in modern times doubts have been cast upon the practice: many eminent naturalists having even gone the length of denying that it has any existence, as Latreille and Huber.

Here is a great discrepancy of statement, and how is it to be reconciled? It would appear that to a certain extent both parties are right and both wrong. The habit is not a universal one: it prevails chiefly, if not entirely, in the warmer and dryer climates, where insect life abounds, and where ants retain much of their activity during the whole of the year; and so far as has yet been ascertained, it does not apply to the ants, denizens of the colder parts of Europe, where they remain in a dormant state during the winter. Moreover, even in the warmer climates, it is only certain species which store up grain; in the Riviera chiefly, if not entirely, Atta barbara and Atta structor; these two species being also of common occurrence in the South of Europe. In India, Brazil, America, New Grenada, and some other countries, ants which store grain have been met with, some belonging to other and different species; but it is a curious fact that all the species hitherto discovered and recognised belong to the genus Atta, or some closely allied genus.

Atta barbara is of a deep black colour, and is from two to four lines in length, but occasionally a variety is met with which is red-headed. The nests are frequently found in wild and uncultivated ground or sandstone rock, covered sparsely with cistus, thyme, lavender, and spiny broom, but usually within reach of the olive terraces or other cultivated ground, from which a supply of seeds could be obtained. Mr. Moggridge gives the following very clear and interesting account of what he saw when attentively watching and examining a nest of A. barbara: 'I had scarcely set foot on the *garigue*, as this kind of wild ground is called, to distinguish it from meadows or terraced land, before I was met by a long train of ants, forming two continuous lines, hurrying in opposite directions, the one with their mouths full, the others with their mouths empty. It was easy enough to find the nest to which these ants belonged, for it was only necessary to follow the line of ants burdened with seeds, grain, or entire capsules, which had their heads turned homewards; and there, sure enough, at about ten yards distance, and partly shaded by the small cistus bushes, lay the nest, to and from the entrance of which the incessant stream of incomers and outgoers kept flowing. The proceedings of the ants were the same as those previously observed in April and May; the workers usually seeking their *harvest* at some distance from the nest, and going in search of it *as far as* the cultivated ground, where the crops of weeds were

more abundant and more varied. In a few cases, however, where the terraces were too far distant, they contented themselves with plundering the grasses, pea-flowers, honeywort, and the other denizens of the *garigue*. In one case I was able to follow the threadlike column of workers from the nest to the weedy terrace, where the plants grew from which they were gathering the seeds, and found that the nearly continuous double line measured twenty-four yards. Even this gives but an inadequate idea of the number of ants actively employed in the service of the colony, for hundreds of them were dispersed amongst the weeds on the terrace, and many were also employed sorting the materials and in attending to the internal economy of the nest. It is not a little surprising to see that the ants not only bring in seeds of large size and fallen grain, but also green capsules, the torn stalks of which show that they have been freshly gathered from the plant. The manner in which they accomplish this feat is as follows: One ant ascends the stem of a fruiting plant of shepherd's purse, let us say, and selects a well-filled but green pod about midway up the stem; those below being ready to shed their seeds at a touch. Then seizing it in its jaws and fixing its hind legs firmly as a pivot, it contrives to turn round and round, and so strain the fibres of the fruit stalk, that at length they snap. It then descends the stem patiently, backing and turning upwards again, as often as the clumsy and disproportionate burden becomes wedged between the thickly set stalks, and joins the line of its companions on their way to the nest. Two ants sometimes combine their efforts, when one stations itself near the base of the peduncle and gnaws it at the point of greatest tension, while the other hauls upon and twists it. I have occasionally seen ants engaged in cutting the capsules of certain plants, drop them, and allow their companions below to carry them away. . . . Occasionally, one or two may be detected carrying a dead insect or crushed land-shell, the corolla of a flower, a fragment of stick or leaf, but I have never seen aphides brought into the nest or visited by this ant, or Atta structor. It sometimes happens that an ant has manifestly made a bad selection, and is told on its return that what it has brought home with so much pains is no better than rubbish, and is hustled out of the nest and forced to throw its burden away. It is interesting to note how, after a shower of rain, the seeds will be brought out by the ants with the fruit of the little root, radicle, or fibril, as the case may be, gnawed off. It frequently happens that on the wild hillside the position of a nest of Atta barbara is indicated by the presence of a number of plants growing on or round the kitchen midden, which are properly weeds of cultivation, and strangers to the cistus, and lavender covered banks of the *garigue*. These have

sprung from seeds accidentally dropped by the ants, and which they had obtained from the Lemon terraces.'

Not only may the nests of Harvesting Ants be speedily distinguished by watching the burdens carried into, but by the character of what is thrown out—that is to say, by the large quantity of the husks of grain and other seed and vegetable refuse lying around the chief entrance to the nest, where in fact they sometimes form quite a large heap, some two or three inches in height and a foot in diameter. I have seen heaps of the husk of grass seed fully as large as this, the ants having evidently helped themselves freely to the lawn seed sown a few days previously. In one of the galleries of a nest of this kind the seeds had germinated, and burst through the earth, the course of the tunnel being indicated by a green line of sprouting grass. The sprouting of the seed noticed was partly due to the gallery being very close to the surface, partly to much rain, but principally, I apprehend, to the fact that the grass seed had been collected in great haste, so that the ants had not yet been able to arrest the germinating power of the seeds; for strange to say, it would appear to be an undoubted fact that Harvesting Ants really possess this power while the seeds are in the granaries of the nest. As to the means whereby this most necessary end is accomplished, no sufficient explanation has been given, and the secret is as yet undiscovered. I have said that the power is a very essential one; for did it not exist the nests in wet weather would soon become chocked and destroyed by the growth of the seeds. The non-germination of the seeds is certainly not due to exclusion of air, since this enters freely through the openings, of which usually there are several to each nest; nor to the absence of moisture, at least in the more superficial parts of the nest, for the seeds when taken from the nest are often found to be in a moist condition. Again, it is not due to want of light, since the seeds are in this respect in the same condition as those planted in the earth in the usual manner; or to mutilation of the seeds, since these germinate freely when removed from the nest; nor lastly, to the presence of the vapours of formic acid, which is secreted by most ants, and with which the atmosphere of a nest is usually more or less impregnated. It is not known even whether the restraining cause lies in the seed itself, or in the structure of the nest or granaries, the floors of which are paved and cemented for the reception of the grain. My own opinion is, that the secret lies in the structural peculiarities of the nest, and especially of the granaries, whereby the seeds are kept comparatively dry, and in the dark. We know how easy it is to prevent seeds from growing by simply placing them in a dry place. Of course all parts of an ant's nest are not equally dry—the granaries

may be so, while the galleries, particularly those near the surface, may be quite moist, or even wet. The fact that moist and non-germinating seeds may sometimes be seen in the galleries of the nest may perhaps be explained by the seeds having been recently brought from the dry granaries; indeed, it seems more than probable that the process of softening the grain through the agency of moisture must be constantly in progress, since ants appear to be incapable of consuming grains and seeds when dry and hard.

Not unfrequently it does happen that the seeds begin to sprout in the nest from excess of moisture, but even for this emergency these clever little creatures are prepared: thus they first arrest the further growth of the seeds by nipping off the radicles, they then carry them out of the nest, expose them to the sun till they are dry, and then bring them back again to the nest. In this way the grain and other seeds become malted, in which state they are much relished by the ants; indeed, it is by no means certain that ants do not in some cases purposely malt the grain.

The number and variety of seeds met with in the nests of Harvesting Ants in the Riviera are very great. Mr. Moggridge has detected upwards of fifty different kinds in the nests of Atta barbara, but even this list might doubtless be much extended by further observation.

Although Harvesting Ants live mainly on seeds, this is not the case with most other kinds. Some of these live on animal food, as dead flies, larvæ, &c., but sometimes they will resolutely attack grasshoppers, caterpillars, and other insects many times larger and stronger than themselves; other species, again, feed on the sweet secretions furnished by plants or elaborated by aphides.

Mr. Moggridge estimates the quantity of seeds in the nests of Atta barbara at about sixteen ounces, or one pound. This, judging from the heaps of the husks of grass seed I have met with, would appear to be a low estimate: however this may be, the seeds stored in the many thousands of ants' nests would amount in the aggregate to a very large quantity. From the descriptions given of some of the Harvesting Ants of India, the stores of seeds laid up in some cases must be very much greater than in the Riviera, or indeed in Europe. Certain it is that Harvesting Ants are very great thieves of seeds. Not only will they travel long distances to obtain them, but they will invade sacks and even drawers in houses to secure the coveted prize; while Atta structor, to be more particularly noticed hereafter, not unfrequently constructs its nest in close proximity to stores of seeds.

The particulars above recorded were derived chiefly from the observation of Atta barbara. The only other species of true Harvesting Ants is, as before stated, Atta structor. The nests of this ant are usually found in cultivated ground, in gardens and

near houses. Mr. Moggridge saw a flourishing colony of this ant in the main street at Mentone, cleverly placed at the lentil of the door of a cornchandler's shop, where the ants were ever on the look out for the stray grains of oat and wheat which might chance to fall from the sacks. Another nest derived its principal subsistence from the seeds which fell from the cage of some birds which hung outside a window. Atta structor is not so frequently seen above ground from November to March as A. barbara.

It has been stated that the nests of the Harvesting Ants of the Riviera consist of a number of subterranean and anastomosing passages or galleries, having one or more external openings, and ending in blind extremities, which are sometimes enlarged into small chambers for the accommodation of the winged ants and larvæ. Here and there the galleries are expanded into chambers of variable form and size—sub-cylindrical, oval, round or angular—and from one to three inches in their longest diameter, these being designed for the reception and storage of the grain; being in fact the granaries of the nest or colony. Sometimes the nests are placed in yielding earth, in others under brick or stone steps or pavement, or even in the hard unbroken rock, which they appear to have the power of penetrating, and where of course the nests are most difficult to get at and their exploration almost impossible. It does not appear that any special pains are taken in the construction of the passages as a rule, though sometimes they are coated with a kind of cement; but with the granaries it is different: these have usually a flat bottom and arched roof, and they are carefully lined with shining pieces of mica, &c., the whole being cemented together and rendered firmer and harder than the surrounding earth, and without doubt less pervious to water. These nests may cover more than a square yard of ground, and may extend one or even two feet below the surface. Occasionally the nests of two or three species of ants traverse the same plot of earth, and even the same entrance serves for them all; the ants themselves, however, except as the result of accident, rarely become intermixed in the same nest.

A very curious fact in the economy of ants is the occasional presence in the nests of other insects, the intrusion of which is not only not resented, but would appear to be sometimes even liked. This is the case with a species of lepisma, or silver fish, a kind of podurus, or spring tail, a small white woodlouse, the larvæ of an elator beetle, and a shining brown beetle, about one line in length, Coluocera Attæ.

Another very extraordinary circumstance is the occurrence of serious and protracted battles, not only between ants of different species, but more especially between those of the same species, but *belonging* to different nests or colonies. In the work of Mr.

Moggridge, so often quoted, the following remarks are met with relative to the battles of the pigmies, the ants: 'Rival colonies of Myrmica cæspitum often gather for the battle into dense masses three or four inches deep, and the place of conflict will be seen on the following day strewn with the dead, and this though the majority of the slain are carried off for food by the victors. But the most singular contests are those which are waged for seeds by A. barbara, when one colony plunders the stores of an adjacent nest belonging to the same species, the weaker nest making prolonged, though for the most part ineffectual, attempts to recover their property. In the case of the other species of ant I have watched fighting, the strife would last but a short time—a few hours or a day,' but A. barbara will carry on the battle from day to day for six or seven weeks, the scene during the whole time being one of war and spoliation. 'An active train of ants, nearly resembling an ordinary Harvesting train, led from the entrance of one nest to that of another lower down the slope, and fifteen feet distant; but on closer examination it appeared that though the great mass of seed bearers were travelling towards the upper nest, some few were going in the opposite direction and making for the lower. Besides this, at intervals combats might be seen taking place, one ant seizing the free end of a seed carried by another, and endeavouring to wrench it away, and then frequently, as neither would let go, the stronger ant would drag seed and opponent towards its nest. At times other ants would interfere and seize one of the combatants and endeavour to drag it away, this often resulting in terrible mutilation, and especially in the loss of the abdomen, which would be torn off while the jaws of the victims retained their indomitable bull-dog grip upon the seed. Then the victor might be seen dragging away his prize, while its adversary, though now little more than a head and legs, offered a vigorous, though of course ineffectual, resistance. I frequently observed that the ants during these conflicts would endeavour to seize one another's antennæ, and that if this were effected, the ant thus assaulted would instantly release his hold, whether of seed or adversary, and appear utterly discomfited. No doubt the antennæ are their most sensitive parts, and injuries inflicted on those organs cause the greatest pain.

'It was not until I had watched this scene for some days that I apprehended its true meaning, and discovered that the ants of the upper nest were robbing the granaries of the lower, while the latter tried to recover the stolen seeds, both by fighting for them and by stealing seeds in their turn from the nest of their oppressors. The thieves, however, were evidently the stronger, and streams of ants laden with seeds arrived safely at the upper nest, while close observation showed that very few seeds were successfully

carried on the reverse journey into the lower and plundered nest. Thus, when I fixed my attention on one of these robbed ants, surreptitiously making its exit with the seed from the thieves' nest, and it having overcome the opposition and dangers met with on its way, reaching, after a journey which took six minutes to accomplish, the entrance to its own house, I saw that it was violently deprived of its burden by a guard of ants stationed there, apparently for the purpose, one of whom instantly started off and carried the seed all the way back again to the upper nest. This I saw repeated several times.'

No doubt, as Mr. Moggridge observes, some pressing need of an increased supply of food must be the cause of these raids; this may arise from exceptional demands made upon the stores by the number and condition of the larvæ in the nest.

The only way of arriving at anything like an exact or full knowledge of the habits and proceedings of ants is to watch them actually at work from day to day, and even at night, and during variations of weather and season, the nests themselves being explored from time to time. A very good plan is to transfer some of the ants of a nest, including the winged male and female ants, and if possible the queen, to a large shallow box filled with any suitable earth; this may be placed in the garden, somewhat elevated above the ground, the box being provided with two or three ways of ingress and egress for the ants, which would thus be allowed their full liberty to go and forage for themselves, and to return to the nest. Or the colony may be placed in a box provided with a large glass shade, and kept in the house, where it will be always under observation, the ants being supplied with suitable food from time to time, consisting chiefly, in the case of the Harvesting Ants, of grain and seeds of different kinds not deprived of their husks, and also with some water. The colonies of Atta barbara readily take to the locality assigned them, and speedily begin to tunnel out the earth and to construct their nests; their proceedings affording much pleasure and amusement to onlookers. Mr. Moggridge noticed, in the case of a nest of Atta barbara kept in confinement, that they were in the habit of removing the roots which had pierced the galleries, and which proceeded from seedling plants growing on the surface. This operation was performed by two ants, one pulling at the free ends of the root and the other gnawing at the fibres where the strain was greatest, until at length it gave way. A very singular habit also noticed was that of throwing the sick and even the apparently dead ants into the water with which the ants were supplied, 'the object of which was in part, I imagine, to be rid of them, and partly, perhaps, with a view to effecting a possible *cure, for* I have seen one ant carry another down the twig which

formed their path to the surface of the water, and, after dipping it in for a minute, carry it up laboriously again, and lay it in the sun to dry and recover.'

With a view to an accurate record of any observations made of the proceedings or habits of ants, it is always necessary that the species noticed should be accurately determined. For this purpose, a few of the ants, including when practicable the winged male and female ants, should be secured and preserved in spirits of wine. The little bottles used by homœopathic chemists for their globules will answer the purpose admirably, since the ants can be examined in these by the aid of a lens without being removed from the bottles.

It is possible that Pheidole megacephala, the large-headed ant, may at times store seeds, but no granaries have as yet been found in the nests, although the ants are not unfrequently seen carrying seeds. Many other species of ants doubtless collect and consume seeds, without storing them as part of their food; but the food of the great majority of ants all over the world consists of honeydew and other sweet secretions, while other kinds live on insects and other forms of animal matter. The greater number of ants, therefore, are either not seed consumers, or consume chiefly the seeds of wild plants and weeds; hence we see how erroneous is the belief entertained and too often cruelly acted upon that ants are the enemies of man, and deserve no mercy at his hands. The practice of exterminating nests of ants by pouring boiling water into the tunnels is one of revolting and needless cruelty.

The two species of Harvesting Ants common to the Riviera are doubtless widely distributed, and they have been found in cold countries, but it is not known whether under such circumstances they preserve the habit of storing seeds. It is possible that as they are in a dormant state during the winter season, they do not require any stock of seed in reserve.

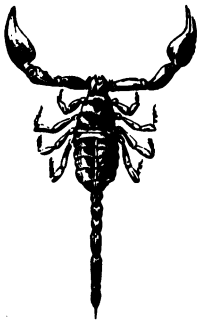
Ants, like most created things, have other enemies than man, which kill and prey upon them; amongst these are lizards, which devour chiefly the winged ants, being apparently afraid to attack the bolder and stronger working ants. Of this the workers seem perfectly aware, as they may often be seen walking fearlessly right up to the noses of the lizard; they also seem quite aware of the danger to which the winged ants are exposed on leaving the nests, since they may often be observed to cluster round and guard them. Another enemy is the tiger beetle (Cicendela) and which also has a prudent fear of the larger working ants. 'I have seen this beetle,' Mr. Moggridge writes, 'lying in wait near a train of Structor or Barbara ants, watching until some individual separated a little from the main body, when it would

rush forward and make a snap at it, retiring again as quickly as it came. If the tiger beetle fails to seize its prey exactly behind the head, it will let it go again, and two or three ants are often thus cruelly mutilated before a single one is carried off. No doubt the beetle has learned that if once this ant clasps its mandibles upon either antennæ or legs, nothing—not even death itself—will make it release its hold. It therefore tries to pin the ant in such a way that it cannot use its formidable jaws. Perhaps the habit of forming long compact trains may have been acquired by the ants partly with a view to guarding against attacks of this kind.'

Again, spiders must be reckoned amongst the enemies of ants; there is one species, I believe, which feeds exclusively on ants.

There are many points connected with the economy of ants still unsolved, and many interesting facts to be learned and questions answered; the Riviera, abounding as it does in species, is a particularly favourable one for the inquiry. To quote once again Mr. Moggridge: 'The way is open; it is not difficult to follow, and it leads to very pleasant places.'

Fig. 27.



THE SCORPION.

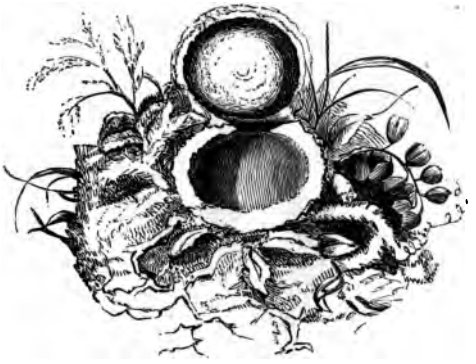
The Scorpion (Fig. 27), notwithstanding the peculiarity of its form, used formerly to be placed in the same class as the Spiders. It is by no means uncommon at San Remo, and I have received many specimens from Colonel Cox, from a photograph of one of which, by Signor Scotto, the figure is taken.

There are several species which belong to the genus Scorpio; that which is found in Europe is S. Europæus. Scorpions inhabit the hot countries of both hemispheres; they conceal themselves under stones or similar things, and are often found in drains and in dark and damp situations, and sometimes even in houses. They run with considerable swiftness, turning the tail over the back; this they can turn in any direction, for attack or defence; they feed on insects, which they are said first to pierce with their stings, the eggs of spiders, &c. The Scorpion carries her young upon her back. The sting of the European species is not usually dangerous, but that of some of the more tropical kinds gives rise sometimes to alarming or even fatal symptoms.

The natural order, Araneæ, Spiders, is in the Riviera a particularly interesting one, and will well repay any attention bestowed upon it, whether we study the geometrically planned webs, the *nests, or the* spiders themselves. Of all spiders the most curious

are those belonging to the sub-order, Teretelariæ, all of which make nests more or less completely buried in the earth; it is in this subdivision that the trap-door spiders are included, and of these I now proceed to treat in as few sentences as possible. These spiders derive the name by which they are distinguished from the fact that they close and secure the entrance to their underground and tubular nests by a door moving on a hinge. This door opens outwards, and since the nest is usually placed on a sloping bank or wall, it readily falls to by its own elasticity and weight when the spider quits its nest; indeed, the door is almost always shut, that is to say, both when the spider is at home and when it is abroad in search of its food. It is, of course, partially open when the spider is in the act of passing in and out of its nest.

FIG. 28.



OPEN TRAP-DOOR OF CTENIZA MOGGRIDGII. (CORK TYPE.)

Sometimes the spider leaves the nest completely, at others it is on the watch at the entrance of its nest for any insect which may approach within reach of its arms.

The nests of the trap-door spiders of the cork type (Fig. 28), to be referred to again hereafter, are usually found on shady, moist, and sloping banks, or loose walls, with earth between the stones—these banks and walls being covered usually with ferns, lichens, mosses, and other plants calculated to afford shelter and concealment. Sometimes moss is actually found growing on the lids of the nests; and Mr. Moggridge entertained the opinion that there was reason to believe that the spiders themselves planted the moss in such cases. On the very thin doors of the Wafer type of nest, 'it is rare to find any of

the larger mosses or lichens growing; but as if to compensate for this deficiency, a variety of foreign materials are employed, which are scarcely ever found in cork doors, such as dead leaves, bits of stick, roots, straw of grasses, &c., and I have even seen freshly-cut green leaves, apparently gathered for the purpose, spun into a door which had recently been constructed.

'But here again there is the widest possible difference between nest and nest in the degree of perfection in their concealment; and although as a rule the surface of the upper door harmonises with the general appearance of the surroundings, there are some individual nests in which it readily catches the eye and even attracts attention. . . . Perhaps in no case is the concealment more complete than when dead leaves are employed to cover the

FIG. 29.

OPEN TRAP-DOOR OF NEMESIA MANDERSTJERNA. (WAFER TYPE.)

door. In some cases a single withered olive leaf only is spun in, and suffices to cover the trap; in others, several are woven together with bits of wood and roots.' (Moggridge.) (Fig. 29.)

The nests consist of silk-like tubes lining the channels or tunnels sometimes a foot in length, which the spider, by the aid of its legs, digs in the earth, the extremity of the tube, opening on the ground, being furnished with a door as already described.

Of these nests there are several different types, the chief of which were first described by Mr. J. Treherne Moggridge—in his most interesting and beautifully illustrated work, entitled 'Harvesting Ants and Trap-door Spiders.'

One of the most simple types is that of an unbranched tube,

furnished at the outlet with a thick and somewhat wedge-shaped door, supposed to resemble a short cork falling into the neck of a bottle: this is described as the unbranched cork type of nest.

The second type resembles the first, but is even still more simple; for the door, in place of being thick and laminated, is thin and membranous, and hence this type is known as the unbranched wafer type.

In the next type the tube is furnished with a short ascending branch, terminating at the surface of the ground, and closed by earthy particles closely bound together by silk and easily broken through, the main tube having a door of the wafer type.

This is the single door branched wafer type of nest.

The fourth type is the unbranched double door wafer type. In this the upper door is thin and wafer-like, while the lower and more defensive door, placed about two inches below the first, is thicker and stronger, consisting of earthy matter encased in strong white silk.

The fifth type is the branched double door wafer nest. 'One of its most distinctive features is found in the shape of the lower door, which may be said to be double, presenting two crowns, one of which fits into the main tube and the other into the branch . . . When the spider has once fairly determined upon resistance, it is scarcely possible to make her retreat without destroying her nest; and in one case when I tried to push the lower door down from above, while she was pushing it upwards from below, I found, without crushing my opponent, I could not succeed.' (Moggridge.)

The last type is that of the branched double door wafer type, with a descending cavity. This cavity is often overlooked in the larger and older nests, from being filled up with the remnants of the insects which have served as food, as well as particles of earth. This is the highest type of trap-door nest hitherto discovered. The sub-order, Teretelariæ, includes other genera and species, more or less terrestrial, besides the trap-door spiders. The nest of the species of the genus Atypus consists of the usual long silken tube; but a portion of this, in place of being concealed in a tunnel in the earth, runs some distance above the surface, the aperture being destitute of any protecting door. This type is therefore more simple than even the unbranched single door wafer type.

The different species of the genus Lycosa, which includes the Tarantula, also form silk-lined nests in the earth, the outlets of which, though not provided with doors, are yet permanently closed during the winter by fibres of wood, fir needles and lichens held together by silk threads. This is the case with the nest of the true Tarantula, Lycosa tarantula, as well as a closely allied

species, L. narbonensis, discovered by Mr. Moggridge in the stone pine wood to the west of Cannes.

Very great ingenuity is also displayed in other ways in the construction of the nests of trap-door spiders. They are at first small in every way and suited to the accommodation of the young spider; with the growth of this the nest is very ingeniously enlarged, not only in length, but, what is more difficult to accomplish, in width also; and of course the door is also enlarged from time to time to a corresponding extent. Eggs and young spiders, also the harder and non-edible parts of the food consumed, are often found in the nest, but the male spider very rarely.

The sub-order Teretelariæ, to which the trap-door spiders belong, are distinguished from all other spiders by the position of their falces or mandibles, which have the fangs directed downwards, and move vertically parallel to one another. Thus when a victim is seized by one of the Teretelariæ it receives first a downward blow. 'With very few exceptions this sub-order may also be known by the presence of four blotches of paler colour at the base of the abdomen underneath, indicating the position of the four air-sacks; almost all, or indeed perhaps all, other spiders have but two.' (Moggridge.)

The trap-door spider is predatory, and for the most part roving and nocturnal in its habits. It either stations itself at the mouth of the nest with the door half raised, on the watch for the passing by of any unwary and unsuspicious creature, or it quits it in search of its prey, the door closing after it, so that no enemy should intrude during its absence; for the spider, like most created things, has its enemies, such as centipes, wasps, lizards, &c. Should one of these enemies approach when the door is open it is immediately closed; and since in the case of the spiders with the thick wedge-shaped or cork-type door this cannot be forced in even by the exercise of considerable strength from without, the only way of entering the tube is by raising the door outwardly; and against this proceeding, which but few of the spider's enemies have the sense to adopt, she—for the spider is almost always the female—offers the most strenuous opposition, by pressing against or clutching hold of the door with all her might. Supposing the outer door to be forced, and there is a second a little distance beneath it, she retreats behind it, and a similar struggle ensues; or should the nest be branched then she will retire into the branch, closing the door of that and shutting herself in; the enemy, not suspecting the existence of this branch, with its protecting door, rushes by to the end of the tube to find that the coveted prize has escaped.

The trap-door spiders of San Remo have been but little studied, but the following species have been found there—Cteniza Moggridgii, *Nemesia Moggridgii*, N. Eleonora, and N. Manderstjerna.

The nests of Lycosa tarantula and L. narbonensis are both distinguished by the external orifice being surmounted ordinarily by a tube which rises about an inch above the ground, and being sometimes as much as two inches in diameter. It is principally composed of fragments of wood fastened together with clayey earth, and 'so disposed one above the other that they form a scaffolding having the shape of an upright column, of which the interior is a hollow cylinder.' (M. Dufour.) The nest or burrow is a foot in length and about an inch in diameter. Four or five inches below the surface the perpendicular tube is bent horizontally, and it is in this angle that the Tarantula watches for its prey. The nest of L. narbonensis is very similar to the above, only that it terminated in the nest, specially examined, in a triangular chamber, two inches across at its widest part; the chamber was strewed with the remains of beetles and other insects.

Should it be desired to preserve any of the spiders met with for the purpose of study and identification, they should be first killed, either with chloroform or cyanide of potassium, and afterwards placed in test tubes suited to their size, and filled with spirits of wine. Thus put up they can be examined with a magnifying glass without removal from the tube. The patterns on the abdomen, and cephalo-thorax, are seen very distinctly in spirits of wine, and these frequently aid much in the determination of the species. It is a good method to fill the nests as far as practicable with cotton wool before unearthing them.

For further and fuller information respecting trap-door spiders the reader is referred to Mr. Moggridge's work, published by L. Reeve & Co., in which many details and anecdotes will be found relating to this most interesting sub-order of spiders.

Another evidence of the warmth of the climate is furnished by the prevalence of Mosquitoes in all the towns of the Riviera, including San Remo. On arriving there in October they are sufficiently abundant to be a source of very considerable annoyance; some of them even survive throughout the winter, especially in houses that are kept very warm, but on the arrival of spring they mostly disappear for a time. Now, although Mosquitoes most abound and are most troublesome in tropical or semi-tropical climates, they are by no means confined to them, and this fact explains in part their survival throughout the Italian winter; indeed, the area and period of their existence seems of late years to be gradually extending; thus they are now common in some parts of Germany, as on the Rhine and in Wiesbaden, and they have even reached London, where some hotels are reported to be infested with them. In Germany, where the climate is so severe, they live throughout the winter in rooms warmed by stoves, as I have myself experienced.

The Mosquito is nothing more than a species of gnat, and it resembles very much the gnat, Culex pipiens, so common in England and with the so-called bites of which we are all familiar; but the bite of the true Mosquito is far more severe in its effects. Having pierced the skin with its sharp tubular lancets, the Mosquito, vampire-like, sucks up the blood of its victim, with which it becomes so gorged that the red colour is seen through its transparent body; but although a bloodthirsty little monster, one must yet give it credit for courage; it does not silently steal upon its enemy, but as it rushes upon him, sounds its trumpet-like war cry, thus giving a timely warning often sufficient to ensure its own death.

Now, although but little is to be found in books on health resorts about the annoyance arising from Mosquitoes, they are in some cases veritable pests, and produce frequently an amount of pain, disfigurement, and discomfort which it would be difficult to exaggerate, especially in the case of young persons who have delicate skins, or who are strangers to the locality, for the natives do not appear to be troubled with them to anything like the same extent, owing, it is asserted, to their having become protected, by frequent inoculation, from the effects of the presumed poison. It has not been proved, however, that the Mosquito really does secrete a poison and infuse it into the wound which it makes; it is more probable that the irritation which ensues is due solely to the depth to which the lancets penetrate, which is very considerable.

Quickly after the stab of a Mosquito, the part swells up, becomes red, smarts, a good deal of irritation ensuing; in this condition the wounds may remain for days, but the effects differ, in some cases being very much worse than others. Sometimes only a small and somewhat hard swelling takes place, showing apparently that the irritation has been limited by a process of adhesive inflammation; in others the swelling which ensues is more extensive, the skin is at first only slightly raised and of a white colour, like the sting of a nettle, but irritation speedily sets in, the white spot becomes red, and the redness and swelling often extend for two or three inches around the original wound: there is always however a line of demarcation observable between the part first affected, which is always the last to lose its redness, and that which becomes subsequently involved in the mischief.

Many remedies have been recommended for mosquito-bites: ammonia, soda, vinegar, chloroform, oil of cinnamon, or of cloves, and Eau de Cologne, but I have never found much benefit to result from any of them. The treatment of these wounds has formed the subject of correspondence in the 'Lancet.' One writer regards soap as infallible, and takes great credit to himself

for recommending it, but, as if not quite certain of its efficacy, he advises that a bottle of strong ammonia should be placed under the sleeper's pillow, and that if bitten he should immediately apply the ammonia to the part, then get up, rub in some soap, and finally resort to the tap and allow a stream of cold water to trickle over it. A somewhat varied and trying course of treatment to carry out in the middle of the night. The soap may be useful, the stream of cold water will be so decidedly, but the bottle of strong ammonia placed under the pillow is objectionable, because of the possibility of the escape of the ammonia and the dangerous consequences which might then ensue. In this case, as in so many others, prevention is better than cure. The beds should be provided with properly constructed mosquito curtains; it is not enough that they have curtains, for the beds of nearly all the houses and hotels in the Riviera are furnished with them, but in the majority of cases the curtains are insufficient and sometimes they even aggravate the evil. Nearly all the curtains I have seen are like those of an ordinary bed, in several pieces, and they do not nearly reach the ground, so that the Mosquitoes make their way under them, and as the curtains are usually closed at bedtime the Mosquitoes are shut in. The curtains therefore should have as few openings as possible and should rest on the ground for some inches; moreover the texture should be light and open, so as not to impede respiration.

A useful precaution in many cases is to burn one of the pastilles of Dr. Zampironi a little time before going to bed, placing it within the curtains. These pastilles consist mainly of Nitrate of Potash, and they may be used without any ill effects; I have found them nearly always to quiet the mosquitoes for the night. A very good plan is to examine the windows shortly before dusk and to kill all the mosquitoes which are often found there at that time, also to be careful to shut the windows early and before bringing lights into a room, as these attract the insects.

The very curious and important fact has recently been discovered, that the Mosquito is the medium of diffusing a parasite, Filaria sanguinis, which infests human blood in tropical and also in some European countries, it giving rise to several morbid conditions, and being the cause of certain diseases, the nature of which has hitherto been involved in much obscurity. The Filaria passes into the body of the Mosquito in the blood which it abstracts from man, and there undergoes a process of higher development; ultimately it becomes deposited in water together with the eggs of the Mosquito, and is thus liable when the water is drunk to be again introduced into the system, usually in a more mature condition.

It will thus be seen that the Riviera affords abundant material

for the instruction and amusement of the invalid, happily endc with a taste for Natural History.

Enough has now been adduced to show that the Nat History of that portion of the Riviera in which San Rem situated is of a very varied character and replete with inte It is much to be regretted that the town does not possess, Cannes and some other places along the coast, a Museur Natural History, illustrating the Botany and Zoology of district. Such a Museum would be a great attraction, and m be so organised as to be self-supporting. All that would required is that the Museum should be started with the sanc and under the authority of the Municipality, as is the Museu Cannes, which is placed in the Hôtel de Ville, or Town I Already the nucleus exists at San Remo for such a Museur the collection of Signor N. Panizzi.

CHAPTER V.

Chief characteristics and effects of the Climate—The same contrasted with London—Effects of the Climate on the functions of the Body—Especially suited for Debility—For those who have resided in Tropical Climates—For the period of Convalescence—The Aged—Persons of Lymphatic Constitution—Unsuited to persons of highly nervous or excitable temperament—Well suited to cases of defective nutrition or malassimilation, as Anæmia and Chlorosis—Not good for Congestive and Inflammatory Conditions or Ailments—Effects and Properties of Sea-air—Characteristics of Mountain-air—Statistics of Mortality at Marseilles, Genoa, and San Remo—Certificates of Death—Medico-Necroscopo—Diseases amongst the Native Population, as Zymotic and Eruptive Diseases; Scrofula; Diseases of the Nervous System; of the Organs of Respiration; Phthisis; of the Organs of Digestion; of the Renal Organs—Total Mortality—Mortality among Winter residents—Acute Diseases frequent—Chronic degenerative disorders far less prevalent—Visitors but little to fear from Zymotic Diseases—Intermittent Fever—Mediterranean Fever—Rheumatism—Gout—Scrofulous Affections always benefited by the Riviera—Diabetes—Diseases of Brain and Nervous System—The Climate not generally suited to Hysteria, Neuralgia, Insomnia—Diseases of the Heart—Of the Organs of Respiration, acute and chronic—Winter residents little to fear from Acute Diseases—Colds—Sore Throat—Tonsillitis or Quinsy—Statistics of relative frequency of Phthisis in the Riviera—Classification of Phthisis—Tubercle Bacillus—Cases of Phthisis for which the Climate is suitable and unsuitable—Results of Treatment of Phthisis in the Riviera—Ditto in the Royal National Hospital for Consumption—Clergyman's Sore Throat—Choice of a residence in Diseases of the Organs of Respiration—Antiseptic Inhalation in Phthisis—Bronchitis—Climate beneficial in Asthma—Diseases of the Organs of Digestion—Liability to Quinsy; to Diarrhœa—San Remo not well suited to most Gastric and Hepatic Affections—Well adapted for Atonic Dyspepsia—Chronic Degenerative Diseases of Kidney—Skin Affections—Affections of the Eyes—Opinions of Medical Writers on the Climate of San Remo—Choice of a residence—East and West ends of the Town—Effects of residence near and far from the Sea—Want of an Esplanade—Want of paths up some Valleys—Precautions to be observed by Invalids—Suitable walks for Invalids—Proper times for Arrival and Departure—A single winter's residence not sufficient—Characteristics of a suitable Summer resort—Dr. Richardson's Atlantis for Consumption.

I NOW come to treat of the most important subject of the book, and of that which to me as a physician is the most interesting.

The preceding chapters on the Meteorology of the district, and on its Botany and Zoology, from the great light they throw on the climate, furnish the data respecting its medical effects and

qualities upon which one is enabled, to a considerable extent, to pronounce an opinion, whether the climate is suitable or otherwise for certain classes of maladies, and for certain special diseases.

In reality three things are necessary to the formation of a correct medical opinion respecting a climate; one is, an accurate knowledge of the climate itself, another an acquaintance with its effects on the native population, and with the diseases to which they are liable or from which they are exempt, and third, experience of the effects of the climate on those who come to San Remo in search of health.

As the description given of the climate of San Remo applies in the main to the whole Western Riviera, so the following account of the medical characteristics of the climate, &c., of the disorders and diseases for which San Remo is suitable, or the reverse, will hold good to some extent for the entire district. Thus the remarks about to follow will possess a wider interest than if they applied to San Remo exclusively.

But it will be well in the first place once more to define the boundaries of the Riviera proper. This, according to all authoritative maps and descriptions, extends from Nice on the west to Lucca on the east, it being divided into two parts, the one being known as the Western Riviera—Riviera di Ponente, and the other as the Eastern Riviera—Riviera di Levante, Genoa forming the boundary between the two.

The shore therefore between Nice and Genoa, embracing about 117 miles, comprises the Western Riviera; but the chief health resorts are all within thirty miles of Nice, and include that city, Monaco, Monte Carlo, Mentone, Bordighera, and San Remo. They are all placed thus near together because the surrounding protecting hills and mountains afford the most complete shelter, and are at the same time more beautiful than elsewhere in the Western Riviera. To describe, as has been done, the coast with its several towns from Marseilles to Nice, about 140 miles, in length, as forming part of the Riviera, involves a geographical error and does an injustice to the health resorts of the Western Riviera proper, seeing that the climate of Marseilles and of the coast as far as Cannes is so inferior in many respects; owing to its being much less protected, it is much colder and more exposed to northerly winds, as shown especially by the altered character of the vegetation and the nature of the prevalent diseases. Even Cannes, strictly speaking, is not within the limits of the Western Riviera, although it may be so regarded on account of its climate, and its being but twenty miles from Nice.

Having thus defined the position of San Remo, and the principal health resorts of the Western Riviera, it will be well in the *next place* to recall to mind the chief characteristics of the climate

of San Remo, that of the whole district resembling it more or less in its general features.

First, it is moderately warm: the mean north shade temperature for the six months' winter season, commencing November 1 is 53·6°, the mean minimum or night temperature 46·2°, and the mean maximum temperature 58·7°. Again, the mean sun-heat with the ordinary black bulb thermometer is 72·4°, and with the vacuum solar thermometer 118·7°; the sun shines on an average on 162 days out of the 181 days constituting the season, with an average daily duration of 7·8 hours, thus leaving only 19 entirely sunless days. Second, it is equable: the greatest variation in the shade temperature ever observed by me in a period of three seasons was 14°, and this occurred only once or twice in a season, the mean season variation being but 5·0°. The mean difference between the maximum north shade temperature and the sun-heat by the ordinary black bulb thermometer was only 13·°: this range is by no means excessive. It will be remembered that the late Dr. Sparks, in his work on the 'Riviera,' relying on the observations of M. Teysseire of Nice, stated that the average difference between shade temperature and sun-heat during the winter amounted to no less than 78° Fahr.; and taking this for an established fact, he naturally commented on what he erroneously believed to be the trying and even dangerous character of the climate of the Riviera. As it is, there is of course a very considerable difference between shade and sun-temperatures, as must always be the case in countries in which the sun possesses great power, the difference being quite sufficient to render certain precautions necessary on the part of invalids. Then it is dry. The average number of days on which rain falls during the winter season is only about 30, and for the whole year 48 days, while the relative humidity, saturation being 100°, is 69·6°, and at 3 P.M. only 66·7°.

Contrast for a moment these figures with those for London only, which is by no means the coldest of English cities.

The mean north shade temperature for the corresponding six months was 40·6°, for the season 1880–81, the mean minimum 34·7°, the mean maximum 47·0°; the mean sun-heat, with the vacuum solar radiation thermometer, 72·0°. The sun shone on 111 days, the average daily duration of the sunshine amounting to only 3·4, thus leaving 70 sunless days. The average number of days on which rain falls is 75, and the rainfall 11·15 inches. In some parts of England the rainfall is of course very much greater. Lastly, the relative humidity is 83·4°, 100° representing saturation.

From the preceding and other data already given it has been shown that the climate of San Remo possesses the following characteristics:—

That it is moderately warm during the winter, even in the shade, the temperature being fairly equable.

That it is very sunny, that there are but few days on which the sun does not shine, and that the duration of the sunshine is very considerable.

That in consequence of the power of the sun and the duration of the sunshine the air is for the most part clear, the sky bright, and there is abundance of light.

That there are but few days on which rain falls, and that the air is moderately dry.

That, owing mainly to the sea and land breezes, the air is kept in movement day and night, and is consequently refreshing and exhilarating.

The combined effect of these several characteristics is that the climate of San Remo is, during the winter season, moderately stimulant and decidedly tonic.

A climate possessing the qualities above mentioned cannot fail to exert a very powerful influence on the functions of the body, for good or evil, in a great variety of diseases.

Owing to the mildness of the climate there is less wear and tear and less strain. The several functions are performed in a more moderate and uniform manner. There being less expenditure of power and less waste, a smaller quantity of food is required, and the stomach has less work to do. The circulation, in particular the heart and its vessels, is exempt from the severe strains entailed by extremes of cold and heat, and which in themselves are often injurious, and not unattended with danger.

The action of the sun on the human body is very complex: the effects are not confined to the warmth derived from its calorific rays; the luminous and chemical rays all exert powerful effects. The sun acts as a stimulant to most of the bodily functions: to elimination, secretion, and absorption; it determines many chemical changes, and promotes sanguification and the coloration or bronzing of the skin.

The effects of the sun on the living organism are thus clearly summed up by Dr. Thaon, in his excellent 'Clinique Climatologique':—

'The effect of solar heat upon the human organism is evidently the same as upon the vegetable organism; the activity of all the functions is increased, the blood moves with greater rapidity, respiration is increased, the peripheral circulation is more active, to the advantage of the internal organs, which thus free themselves from stagnant blood, charged with excrementitious principles.

'But it is not temperature alone which governs vegetation, but above all light. It is light which is the principal agent of *living chemistry*. The experiments of H. Macagno show that

vine-branches covered with a blackened cloth receive a much greater quantity of heat from the sun than others exposed directly to it, and yet the first produce but few flowers and no fruit, while the latter are laden with grapes. It is light which constitutes the chemical climate, and it is that which controls vegetation, and produces those enormous differences in the development of life between stations which present, nevertheless, similar temperatures.

'The sun strongly colours plants, gives to the flora of the mountains its vivid tints; it increases the pigmentation of the skin of animals, it gives to the plumage of birds and the hair of animals deep tints, it has the same effect on the man who exposes himself to the sun—his skin is darkened with pigment, becoming sunburnt. After a sojourn of some months in a station well exposed to the sun, the phthisical acquire a brighter complexion, which replaces their habitual pallor.

'The sun reddens the blood, it cures chlorosis in the same manner as it restores the colour to plants bleached in darkness. It is known that there exists between the "chlorophylle" of plants and the "hémoglobine" of animals very close relations; these two substances lose or increase in colour according to the quantity of oxygen they absorb; they are the direct agents of the respiratory function in man and animals.'

Again, the dryness of the air produces other important effects; thus it causes the skin to act more freely, to throw off more watery vapour, and to eliminate a larger quantity of a variety of excrementitious substances. 'Dry air,' states Dr. Thaon, 'favours the excretion of moisture from the lungs and from the surface of the skin by means of the insensible perspiration. This watery vapour carries with it a number of excrementitious principles, so that dry air plays an important part as a purifier, and helps the respiratory function when suffering in consequence of pulmonary disease.

'Dry air stimulates the digestive functions, and by exciting the action of the skin serves as a derivative, relieving thereby the functions of the intestines; for in no other way can one explain the beneficial influence of the dry Mediterranean climate on the diarrhœa of tuberculous patients, and the improvement of their appetite due to the same cause.

'On the other hand, when the air is damp, the digestive functions languish, and the diarrhœa, which is one of the commonest and most formidable complications of phthisis, remains uncontrolled.'

Another writer, Dr. A. Baréty, in his excellent and eminently practical little work, 'Nice and its Climate,' from which I shall have occasion to quote again hereafter, thus writes in reference to an over dry climate:—

'An excessively dry air is, indeed, undesirable, since it produces a harsh state of skin, readily appreciable by the hand, and disturbs the general health in a way that varies in degree according to the impressionability of the individual. The forms which this disturbance takes are such as unwonted excitability of the nervous system, irritability, unusual sensitiveness, a vague sense of discomfort, sleeplessness, and sometimes headache.'

The above sensations and effects are seldom experienced at San Remo, in consequence of the more sedative nature of the climate; and even in those exceptional cases in which they are experienced they frequently, as people become acclimatised, wear off. The excitability is more apt to be experienced near the sea, and it is often sufficient at once to remove it to change the residence for a more inland situation.

Where such effects do not ensue, the stimulation exerts a beneficial effect, the activity of all the bodily functions is increased, and appetite, digestion, sanguification, and nutrition are improved.

Though fresh, stimulating, and tonic, the air is but little exciting; far less so than at some of the other health resorts of the Western Riviera. The causes of this difference are to be found in the more complete protection from irritating, northerly winds; in the nature of the soil, which, containing in some parts an admixture of clay, is more retentive of moisture, and in the greater amount of vegetation in and around San Remo; for not only are the surrounding hills crowned to the tops with olive trees, but the mountains are covered with forests of pine trees.

It may safely be said that there is no place on the face of the globe the climate of which at all times and seasons is absolutely perfect and suited alike for persons of all ages, constitutions, and conditions. With even the most favoured climes there are always some drawbacks, and this statement is true of San Remo, and still more of most other places in the Western Riviera.

San Remo, as are most seaside places, and like the rest of the Riviera, is windy, especially near the seashore, the winds blowing occasionally with great force.

It has been shown, however, that San Remo is well screened from the cold north wind by the high mountain barrier of Monte Bignone, and to a very considerable extent from the north-east and north-west winds.

Easterly winds are somewhat prevalent, and the protection afforded against them is incomplete; these winds, especially the north-east wind, are very unpleasant, but still they are not to be compared in their effects to the same winds in England. The north-west wind, or Mistral, is also felt in San Remo, although its force and frequency are very much less there than at Hyères and Cannes. Indeed, the further the town is placed eastward the less the Mistral is experienced. Many people call every wind

coming from the west a Mistral, but the true Mistral is a north-westerly wind. The effect of strong winds unaccompanied by rain, particularly of the north-west wind, in causing a dry state of the air, is really remarkable; thus, during a strong gale, the relative humidity will, it is said, sometimes descend even below 20°, although I have never found it so low. This effect would appear to be due to the incoming dry wind, driving before and re-placing the moister wind with which it comes in contact. The rapidly moving dry air quickly carries off from the body the insensible perspiration, dries up the skin, and by abstracting caloric from the surface gives rise to a feeling of chilliness; it moreover promotes the escape of moisture from the lungs. But there are still other effects produced by high winds; thus, they give rise to variations in the pressure of the atmosphere on the body, and they probably alter the electric condition of the air. Of course, the air in the Riviera sometimes becomes dry and irritating from other causes than high winds, as from the long continued absence of rain. I have not seen the effects of strong winds in the Riviera on the air noticed and dwelt upon as they should be; but I believe they go far to explain why such winds are so exciting, and they also serve to show, what has hitherto seemed to me to be difficult to explain, why the air near the seashore, which is more exposed to winds, should be more irritating than that further from the sea.

In the case of San Remo, the effects produced by strong, drying winds, as already pointed out, are modified by the more humid character of the soil, and the more abundant vegetation covering the protecting mountains.

A second circumstance to be held in remembrance, in considering the climate of the Riviera, and indeed of all sunny countries, is the difference between shade temperature and sun-heat; this, in the case of San Remo, although in general much exaggerated, as I have elsewhere shown, is yet sufficiently considerable to render great care necessary on the part of invalids.

For a little time before and after sunset still greater care is necessary, for not only is there then a rapid decrease of temperature, but if the sky be clear and cloudless, there is a copious deposition of moisture in the form of dew; the two causes acting together sometimes giving rise to chills and colds in the case of delicate people, who then imprudently expose themselves: after a time the air becomes freer from moisture, and it again feels much warmer. On cloudy evenings there is no deposition of dew and no sudden fall of temperature, so that the air keeps quite warm, and it is then safe for most persons to be out.

On dull, cloudy days the air often feels warmer than on some sunny days. The reason of this is, that the loss of moisture and

heat by the skin is less than in bright sunshine, with a fresh breeze and clear sky, and the sensation of cold is not experienced to anything like the same extent.

Another peculiarity of the climate of the Riviera is the sensation of cold experienced by most persons, particularly in the shade, when the weather is dry and fresh, and which is greatly in excess of what can be accounted for by the actual temperature as shown by the thermometer. This feeling is often so great in the months of December and January, as to cause many persons to complain at times of the coldness of the Riviera, and to say they feel the cold as much as in England. It is in the house that the greatest cold is experienced, the air usually feeling several degrees colder than out of doors; indeed, the external air is seldom so cold as to be trying. This difference is partly explained by the fact, that the light and heat of the sun reach the interior of dwellings only with difficulty, especially those parts facing northwards, and partly by the circumstance that the inmates are unable to take sufficient exercise to keep themselves warm. The causes of this marked sensation of coldness have already been more than once referred to; it is due mainly to the rapid evaporation of moisture and abstraction of heat from the skin, occasioned by the fresh and dry air with which it is brought into contact.

It may be questioned whether the moderate degree of cold experienced at times during ordinary seasons is not really beneficial rather than the reverse to most invalids, especially those suffering from pulmonary consumption. The cool air exercises a bracing effect, promotes appetite and digestion, increases nutrition, and so improves the general health and strength. On the other hand, continued warm weather exerts contrary effects—fever is increased, the appetite impaired, and the strength reduced. Alternations of temperature within limited degrees, within in fact such limits as are here usually experienced, rarely exceeding ten degrees, are highly conducive to the promotion and maintenance of health.

Several medical writers dwell on the undesirability of a too prolonged residence in a very equable and warm climate, as being calculated to induce debility and all its consequent evils, and they point out that moderate atmospheric changes, including changes of temperature, are beneficial rather than hurtful. Amongst these may be mentioned Sir James Clark, Dr. Combe, Dr. Edwin Lee, and Dr. Rullmann, whose work, entitled the 'Therapeutic Influence of Southern Climatic Sanitaria,' we will now quote, as his remarks are particularly to the purpose. 'Much importance has been attached to uniformity of temperature, and it is certain that great and sudden changes act injuriously on those affected with *pulmonary* disease; but a moderate alternation has for the most

part a beneficially exciting and strengthening influence on them, particularly on those who are of a weakly constitution, while great uniformity may produce prejudicial relaxation. We often observe this in our summer: when a high temperature has prevailed during the day, a mild night and morning coolness has a particularly refreshing and animating effect, both on the healthy and on invalids. Alternations of temperature have no longer an injurious influence when they take place with a certain constancy and regularity.' 'But the warmth,' Dr. Rullmann points out, 'must not exceed a certain degree,' and he calls attention to the fact, 'that all the southern climatic sanitaria of acknowledged repute lie within the temperate zone.'

Such, then, are the chief characteristics, favourable and otherwise, of this climate; the advantages greatly predominating. One paramount gain is that the invalid is able to take all but daily exercise, and this in bright sunshine even in mid-winter.

As already remarked, there is much in common in the general character of the climate of the Western Riviera, the differences observed between one town and another being due to the more or less complete shelter from the colder winds, the relative proximity to the towns of protecting mountains, the nature of the soil, and the amount of the vegetation.

It is obvious that such a climate must be capable of producing important effects on the human body, and must possess considerable curative properties.

From a knowledge of the climate and its general effects on the functions of the body one might in many cases at once indicate some of the general conditions and diseases for which it was suitable or otherwise. From what has just been advanced respecting the moderately stimulating and bracing effects of the climate, it follows that it is well adapted for cases of simple debility, especially in young people, who without any special disease are yet of feeble constitution and health, and who, therefore, from this feebleness might become liable to consumption.

Furthermore, the climate, from its moderate character, and the absence of extreme cold or heat, is singularly well suited to persons who have lived for many years in tropical climates and whose health has become thereby impaired; in the winter it is just fresh and cold enough to gently stimulate and brace the vital powers weakened by residence in hot countries.

It is especially suited, for the same reasons, to the period of convalescence, recovery being in many cases promoted and ensured.

It is well known that the vital powers of the aged are insufficient to enable them to resist the cold, and especially the combined cold and damp, of such a climate as England. Whenever such weather occurs in the winter there, numbers of aged people

succumb, and the obituary column of the 'Times' is filled with the names of many who, in a milder climate, such as that of which we are writing, might have lived on for years. The mild, dry winter climate of San Remo is therefore admirably adapted to the aged, they being able to take daily walks and drives, and so to enjoy the bright sunshine.

Dr. Baréty, in his recent work, 'Nice and its Climate,' of which Dr. West has favoured us with a free and concise translation, states:—

'The aged generally derive great benefit and a marked increase of vigour from a residence by the sea. It is indeed by no means unusual to see aged people of eighty or even ninety years of age, who have gained a sort of second youth under the influence of the sunshine and sea air.'

I may here state, that I shall have occasion to refer more than once to Dr. Baréty's book, and when I do so, it must be understood that I quote from Dr. West's translation of the same, in which the views and opinions of the author, if not expressed in his precise words, are yet very clearly stated, and in a form perhaps better adapted to English readers. I have, however, myself perused the original work with much interest.

The young are almost equally incapable of bearing cold, damp, and inclement weather, and the same conditions which carry off so many elderly and old persons are scarcely less fatal to children, especially those who are delicate.

Again, the stimulating properties of the climate render it exceedingly well adapted for persons of a phlegmatic or lymphatic constitution or temperament.

For the same reason, as a rule the Riviera, especially the more stimulant parts of it, is in general unsuitable for those of a highly nervous or excitable temperament. At all events, such persons should not live near the sea, or they may choose the more sedative climate of the Eastern Riviera, as Nervi or Spezzia. A distinction should, however, be made between those who are habitually and constitutionally nervous, and those whose nervousness depends on mere debility, the consequence of previous illness. In this latter case the climate will usually prove beneficial. The reader will scarcely need to be reminded that the climate of San Remo is less stimulating than that of some of the other health resorts of the Riviera.

The same qualities of climate adapt it particularly to conditions indicative of defective nutrition or malassimilation, as anæmia, chlorosis, and amennorrhœa.

They also render it for the most part unsuitable, especially near the sea, for congestive and inflammatory conditions and *ailments.*

It should be clearly understood, however, that many of the cases for which a residence near the sea is unsuited, often do well at a little distance therefrom.

Here I may quote with advantage some remarks by Dr. Burney Yeo, taken from his recent work on 'Health Resorts,' relative to the effects and properties of sea air.

'But disregarding for the present the absolute density of sea air, a more important point to be attended to is the great and frequent variations of barometric pressure met with on the sea and on seacoasts. Now it has been shown by careful experiment that all rapid variations in atmospheric pressure increase the activity of the circulating and respiratory organs, and that the perfection of organic life depends on these alternations of excitement and repose. We are justified then in assuming that rapid changes in the barometric pressure are more favourable to vital functional activity than its relative stability.

'It has also been shown that the barometric variations at the seaside, besides being greater in amount than inland, occur with far more regularity, a circumstance which is regarded as tending to promote the accommodation of the organism to its new conditions.

'These then are the most important properties of sea air:—1. Excess of ozone; 2. Excess of aqueous vapour and equability of temperature; 3. Great purity and absence of organic particles; 4. Maximum density, and great but regular variations of barometric pressure. The small amount of iodine and bromine diffused in sea air may not be without a real influence on some organisms.'

The characteristics of mountain as contrasted with sea air are—1. Diminished density; 2. Lower and less equable temperature, with greater difference between sun and shade, and day and night temperatures; 3. Less moisture. Like sea air it is rich in ozone.

It will now be advisable to adduce some testimony showing the prevalence or otherwise of certain diseases amongst the native population. Upon this subject the statistics of mortality should throw much light; but these statistics should relate to the health resorts of the Riviera itself, and not to distant places. Unfortunately, however, such statistics are exceedingly difficult to obtain, and even when procured implicit reliance cannot in most cases be placed on them.

The late Dr. Sparks, in his work on the 'Riviera,' has discussed at some length the returns of deaths for Marseilles; but these, interesting as they are in th emselves, throw but little light on the comparative frequency or otherwise of certain diseases in the more sheltered parts of the Riviera proper. Thus

Marseilles is a large city of 380,000 inhabitants; is much exposed to cold winds and rapid changes of temperature, so that it has an exceedingly high mortality, no less than 38 per 1,000 of the population; many deaths being attributable to acute inflammatory diseases of the organs of respiration.

The mortality returns of Genoa are more to the purpose; although this city possesses a very variable climate, is subject to keen cutting winds, and is much colder than the more protected health resorts. Hence even these returns show a considerable proportion of deaths from acute diseases and from chest affections. The returns for Genoa were very carefully examined some years since, some interesting and important facts being thereby brought to light; these returns must be understood, however, as representing results far less favourable than they would be in the case of any of the more sheltered health resorts of the Western Riviera.

Dr. King Chambers, in some valuable lectures on the 'Climate of Italy,' which are specially noticed by Dr. C. T. Williams, in his work on the 'Climate of the South of France,' has compared the registered mortality of Genoa, which forms the eastern boundary of the Western Riviera, with that of London for the year 1862. Dr. Chambers has shown that the proportion of deaths from chronic disease is smaller at Genoa than in London, in the proportion of 1 in 5·6 in the former place, and 1 in 3·2 in the latter, and he states that the more decidedly chronic the disease, the more marked the difference. Anasarca in London caused 1 in 93 deaths and in Genoa 1 in 239. Chronic affections of the respiratory organs, including asthma and bronchitis, but excluding phthisis, caused in London 1 in 10, and at Genoa 1 in 20 deaths respectively. Aneurism occasioned in London 103 deaths, while in Genoa none were attributed to that cause. Chronic disease of the heart caused in London 1 in 27, and at Genoa 1 in 33 deaths. No deaths from diseases of the kidneys were registered, but it is probable that some of those from general dropsy were really due to that disease.

The proportion of deaths from acute disease, excluding zymotics, is in Genoa 1 in 3·3; in London 1 in 7·7. Acute affections of the respiratory organs caused 1 in 9 deaths in Genoa, and 1 in 16 in London. Acute affections of the intestinal canal, including enteritis, gastritis, diarrhœa, and dysentery, occasioned in Genoa 1 in 8·9, and in London 1 in 30·3 deaths. Acute affections of the nervous centres caused in Genoa 1 in 59, and in London 1 in 119 deaths. From apoplexy and cerebral congestion there were in Genoa 1 in 12, and in London 1 in 40 deaths. Acute inflammation of the heart occasioned in Genoa 1 death in 44, and in London 1 in 606. The preceding figures clearly show *that, while* chronic and degenerative diseases are far less common

in Genoa than in London, on the other hand, acute diseases are very much more frequent in the former place than in the latter; and although the above statistics are founded upon the mortality of the two cities only, the general conclusions undoubtedly hold good to some extent for the greater part of Italy and England. The comparison no doubt is more striking in the case of Genoa than it would prove to be in some other Italian cities.

I have recently examined with great care the certificates of death occurring amongst the native population of San Remo for the years 1877 to 1881 inclusive, excluding not only deaths amongst the foreign element, but also those which took place in the outlying towns and districts of Poggio and Verezzo. I have classified and tabulated the deaths in natural order, intending to publish the tables, hoping therefrom to have obtained much valuable information. Unfortunately, however, it is to be feared that the recorded causes of death are not in all cases reliable. This is assuredly so in the case of some of the causes of death amongst the English and other winter residents.

This arises mainly from the fact that the causes of death in nearly all cases are not certified by the medical attendant, but by the 'medico-necroscopo;' that is to say, by a medical man specially appointed for the duty, and who is dependent almost entirely for his information upon the relatives and friends of the deceased. The consequence of this is that grave errors are by no means of unfrequent occurrence. Notwithstanding this serious drawback the data obtained furnish some useful information, and confirm in some particulars the statistics of mortality already quoted for Genoa. Another defect which detracts greatly from the value of the death certificates is the absence of any information as to the period during which the disease has lasted. It thus becomes impossible to distinguish between acute and chronic diseases; in fact, the whole aim and object of the certificates seem to be simply to establish the fact of death having taken place, and without any regard being paid to the medical and national importance of a correct system of registration of the causes of death. I know not whether the same system prevails in other towns, but if so the returns are open to the same objections.

I learn from M. Yeats Brown, Esq., H.B.M. Consul for Genoa, 'that deaths occurring there are certified, in the first instance, by the medical man attending the patient, if there was a medical man in attendance, or by the midwife, or by any one else, in fact, who may be best able to give information. After this, and before permission to bury is given, the town doctor, or "medico-necroscopo," in all cases makes his visit, and reports to the municipality.'

The printed form of certificate of death specifies that the person signing it must come under one of the following denominations: 'Medico-curante, medico-necroscopo, perito-giudiziario, direttore di stabilmento sanitario, levatrice, &c.'

The certificate of death for Mentone, which is in France, has to be attested by a doctor, but it is not stated whether he must be the medical attendant or not; neither is it required that the duration of the disease or illness should be declared.

It may here be stated that the average mortality for the five years, over which the statistics about to be examined extend, amounts to 21 per 1,000, which, under the circumstances, must be regarded as moderate. Although it is not possible to distinguish accurately the deaths due to acute diseases from those resulting from chronic disorders by means of the certificates, still the general conclusion would appear to be warranted that acute inflammatory affections are of less frequent occurrence than they are at Genoa.

The certificates prove, however, that certain fevers and eruptive diseases are by no means of uncommon occurrence amongst the native population, and that they not unfrequently terminate fatally. In 1877 there was an outbreak of measles and scarlet fever in a very severe form; in 1879 typhoid fever prevailed, and in 1880 hooping cough was very prevalent.

The statistics of deaths from zymotic and eruptive diseases in San Remo for the five years show that it behoves the authorities to be on the alert, to look well to the state of the town, and to adopt every means possible, with a view to improve and ensure its sanitary condition, and to guard against any fresh outbreak of epidemics. It is good to be warned in time, and not to wait until typhoid or some other epidemic disease breaks out, as it did at Cannes during the winter season of 1881–82. There are many things which might and ought to be done with a view to the improvement of the town in a sanitary respect.

The number of deaths attributed to scrofula is but nine, and one death only is assigned to rickets; and judging from these figures and from observation and experience one would be led to the conclusion that scrofula, and still more rickets, are rare affections amongst the native population.

No less than ten deaths are attributed to elephantiasis; but these deaths occurred, I apprehend, amongst the patients in the Hospital for Lepers at San Remo, and to which hospital patients were formerly brought from all parts of the kingdom. There is not a single certified death from diabetes.

Strictly speaking, the deaths from phthisis, tabes mesenterica, as well as from some other diseases, should be classed under the head of scrofulous diseases.

It appears that in the five years over which the statistics extend, in a mean population of 13,590 inhabitants, there were 90 deaths due to diseases of the nervous system, but of this number no less than 42 deaths were set down to 'convulsions,' chiefly, no doubt, infantile; due in some cases to dentition. The word convulsions as a cause of death is of course exceedingly unsatisfactory, from its indefiniteness. Convulsions are not a disease in themselves, but merely a symptom of a variety of conditions and affections. Of the remaining deaths, 40 at least were from diseases of the brain. No case of death from hydrocephalus is reported, and 4 only from mental affections. There were 5 deaths from disease of the nervous system, 2 from spinal disease, and 3 from epilepsy.

The conclusion, therefore, seems warranted from these figures that diseases of the brain and nervous system, though less rife than they are in Genoa, are of somewhat frequent occurrence in San Remo. It does not appear from the statistics that any deaths have taken place at San Remo from sunstroke or heat apoplexy, although it is possible that one or more of the deaths from apoplexy may have been due to sunstroke. Cases of heat apoplexy do occur from time to time amongst the inhabitants.

It would appear from the certificates of mortality from diseases of the organs of respiration that a considerable proportion of the deaths in San Remo amongst the native population is due to this class of disease. Many of the deaths have been occasioned by acute forms of lung affection, and a still larger proportion by chronic diseases. Pneumonia, pleuro-pneumonia, broncho-pneumonia, bronchitis, and particularly catarrhal bronchitis, have all proved fatal in many cases.

Phthisis also is credited with a large number of deaths. It is greatly to be regretted that the statistics of mortality from diseases of the organs of respiration are open to so much doubt. Had they been reliable they would have been of great value, for I believe that no really trustworthy statistics of mortality in the Riviera from this class of diseases amongst the native population have hitherto been published; but to this subject I shall return later on.

Diseases of the organs of digestion are prevalent amongst the inhabitants of San Remo, as they are elsewhere in the Riviera, a large proportion of the deaths being attributed to gastro-enteritis, acute and chronic. Diarrhœa is said to have occasioned only 27 deaths, not a very large proportion; 27 deaths are assigned to tabes mesenterica, and 33 to diseases of the liver.

It is evident from the figures under the head of organic

diseases of the kidneys that affections of those organs are of rare occurrence; this is only what might have been anticipated, and is in accordance with results previously recorded. Of the 25 deaths from dropsy some, no doubt, were occasioned by diseases of the kidneys, and others by affections of the liver and heart.

The total mortality from all diseases for the five years, excluding 133 stillbirths, was 1,412. Of these no less than 294 are assigned to causes so indefinite as not to admit of any proper classification; of these 147 deaths are attributed to marasmus, or wasting, and 5 to 'gracilita,' or thinness; but these are not disorders themselves, but the symptoms and accompaniments of a variety of diseases. Again, dentition, or teething, is not a disease, but a natural process, although it very frequently does give rise to serious and often fatal disorders.

The total number of deaths for the five years amongst the foreign element was 208; of these 119 were stated to have arisen from phthisis, while in 52 cases there did not appear to be any separate certificates of death, as in the other cases, although the deaths were duly entered in the books with the words 'phthisis pulmonale' in many cases written after the names. In one or two cases the causes of death are to my own knowledge incorrectly assigned; and I have reason to believe that the number of deaths from consumption is overstated amongst the visitors. Whether it is so in the case of the inhabitants I am unable to declare.

The way thus far being cleared, I am now in a position to proceed further, and to consider in detail the question of the suitability or the reverse of the climate of the Riviera for certain diseases, and especially those which are so often sent to the Riviera. And here I would refer the reader in the first place to the statistics of the mortality for Genoa, which will be found at page 198, and which show, amongst other important particulars, that while acute diseases are frequent, chronic and degenerative diseases are far less prevalent than they are in London and indeed in England and many other countries; these conclusions being confirmed in the main by the mortality returns for San Remo.

The different classes of diseases may be taken in the order of their natural classification.

Although zymotic and eruptive diseases are by no means uncommon in San Remo and elsewhere on the Riviera amongst the native population, and although they sometimes prevail as epidemics, even assuming occasionally a severe form or type, yet visitors and invalids have but little to fear from them. The chief diseases, judging from the past, to which any liability *exists, are* scarlatina, diphtheria, measles, typhoid fever, hooping-

cough, and erysipelas; but the risk is very inconsiderable. Amongst the winter residents at San Remo three deaths are attributed to scarlatina during the five years over which the statistics already referred to extend, and one to diphtheria, but no death from any other of the diseases mentioned. It should be remembered that some degree of liability to zymotic diseases exists in nearly every town and city of the world; and that it is the poor who are the chief sufferers, in consequence of the insanitary conditions by which they are too frequently surrounded.

It is usually affirmed and believed that contagious and infectious disorders are in the Riviera of infrequent occurrence, and that they are usually of a mild type.

In Dr. Sparks's 'Riviera,' the following remarks occur:—

'Epidemic diseases, measles, scarlet fever, and hooping-cough are much less prevalent than in the North, and owing to the mildness of the climate they are much less dangerous. I found scarlet fever especially, considered by several of my medical friends, of long experience on the coast, as comparatively harmless.'

Again, Foderé writes: 'The eruptive fevers are always mild in this country;' and he goes on to state that he observed an epidemic of scarlet fever at Nice in 1802, a very long time ago, which attacked adults and children alike, but which was not followed by any of the bad symptoms which render it a grave affection in cold climates.

Dr. Sparks, moreover, refers to an epidemic of scarlet fever at Mentone in the spring and early summer of 1878; cases of the same disease being reported in the old town at Nice.

Notwithstanding this testimony, there can be no doubt but that epidemics of this class of diseases are of not unfrequent occurrence in the Riviera, and that they sometimes even assume a serious form; indeed, it would be strange if this were not so. I have already referred to the mortality from outbreaks of zymotic diseases in San Remo within a period of five years, and most persons will scarcely need to be reminded of the prevalence of typhoid fever in Cannes during the early part of the year 1882.

I have attended two fatal cases of scarlet fever at San Remo, one of a visitor, the other of a native. The first proved rapidly fatal, the disease being communicated to three of the attendants, in one of whom the disease was followed by albuminuria and ascites. I have also attended some severe, though not fatal, cases of typhoid amongst visitors. In two of these the disease was not imported, though in some other cases it was so. Indeed, typhoid fever is more frequently imported than acquired on the spot, and this is the experience of other physicians practising in

the Riviera. Dr. Sparks writes: 'Sometimes the disease is imported from Paris, where there is always plenty of it about, or from Rome, Florence, and Venice.'

It cannot be too generally known that typhoid fever is so little infectious that many medical men entertain the belief that it is not infectious at all, but contagious only; that is to say, that the disease is communicable chiefly by the introduction into the system (by drinking water, or in some analogous manner) of a minute quantity of the ejecta of the person affected. It follows, therefore, from this, that there is no occasion for the great and unreasoning alarm which often prevails among the inmates of an hotel when a typhoid case is brought from a distance and *has not had its origin in the hotel* itself. Under these circumstances, with certain due precautions, there is very little to fear, and there is no reason for the precipitate departure which has been known to take place in such cases.

With scarlet fever, measles, and some other diseases, the case is very different.

It should be remembered that visitors incur comparatively little risk of infection; still it is always prudent to look well to the drainage and other sanitary arrangements of any house which may be taken, and not to allow young people and children to make too many visits to the old town, although this is usually wonderfully clean and free from smells, all things considered.

Although no fatal case is recorded amongst visitors, yet erysipelas of the face sometimes occurs.

No fatal cases of intermittent and remittent fevers are recorded in the mortality returns, yet these diseases do now and then occur in San Remo and the neighbourhood, while in some localities of the Western Riviera these fevers are met with not unfrequently. At Nice some years since intermittent fever was common, but with extended drainage and building it has almost disappeared from the city, although it is still sometimes found in low-lying land. In San Remo I attended a visitor, a little boy, two successive seasons, with intermittent fever, which at first assumed the quotidian form, but after a few days passed into the tertian type. It yielded gradually to quinine; but a singular fact in the history of the case was the recurrence of the fever in the same patient and in the same house, this being placed not far from the sea in an elevated position, and its surroundings being in every respect satisfactory.

I may here incidentally mention that a fit of shivering may come on at any time from sudden exposure to cold and damp. Such an attack is at first rather alarming, but if hot drinks be administered, the patient put to bed, and a sudorific be given, *usually the attack* passes off quickly, and no harm ensues.

Occasionally one hears what is called Mediterranean fever spoken of, and I have even seen announcements of deaths in the papers from this cause. It should be known, however, that there is no fever special to the Mediterranean which would require to be distinguished by a specific name; what is called Mediterranean fever is simply the well-known remittent fever, a fever of malarial origin, like ague, and one of very rare occurrence in the Riviera proper.

Wishing to obtain as much information as possible in reference to this so-called Mediterranean fever, I addressed myself to Dr. Henry Bennet, of Mentone, and Dr. Drummond, of Nice, and I now append some extracts from their replies:—

Dr. Bennet writes: 'I have been twenty-two years here, on the Mediterranean coast, and have never yet seen a case of fever different to what I have seen in Paris and London. I know not personally what the Mediterranean fever is, unless it is a mixture of malaria and typhoid, or simply synocha, lasting ten or twelve days, without petechiæ, which I have seen occasionally in young and old all my life. I believe, however, that in malarious regions there is a combination of malaria and typhoid. Perhaps that is the Mediterranean fever.'

Dr. Drummond's remarks are as follow: 'Enteric (typhoid) and the eruptive fevers resemble in all respects the same diseases as at home, only, as a rule, the eruptive fevers seem of a milder type. I have treated several cases of intermittent fever, that is of fevers evidently of a malarial character and cured by quinine, but these cases were imported, being either of Indian origin, or the patients had come from Southern Italy, and were taken ill here soon after arrival, or had been taken ill *en route*; several of these cases had become ill in Italy, and they were laid up here on their way home. The only fever I have seen here differing from my home experience is a simple continued or sub-continued fever, usually following exposure to a hot sun and fatigue. The symptoms were exactly those given in Cullen's "Nomenclature," under "Febricula" or "Synocha," only in the cases coming under my notice the symptoms were usually of a severe form—with rigor, headache, often severe, quick, full pulse, high temperature, sometimes over 104° Fahr., and in severe cases continuing high for two or three days, the thermometer not showing more than a rise or fall of one degree in the twenty-four hours, the morning temperature being often as high or even higher than that of the evening. In severe cases delirium. No eruption. No evidence of being contagious. All this generally ended in from a week to ten days.'

I now pass on to the consideration of those diseases which are usually regarded as constitutional.

First I will refer to rheumatism. It is certain that acute, articular rheumatism is by no means uncommon in the Riviera, and that it occasionally terminates fatally. No doubt the same causes which give rise to the comparative frequency of acute inflammatory affections in general are also in operation in the case of acute rheumatism. Amongst these causes is probably the considerable difference between shade temperature and sun-heat; the liability to sudden chills, especially when the body has been heated and the skin is perspiring, in the absence of sufficient clothing and proper care, being thereby increased. The cold, sunless streets of the old town and exposure to bad weather doubtless also account for some of the attacks. Amongst careful, well-fed, and sufficiently clothed persons the disease is comparatively rare. Foderé states: 'Rheumatism and gout are very rare in the Alpes Maritimes, and I have remarked among the foreign visitors that the climate is very favourable to the cure or relief of arthritic pains.' The equability, dryness, and comparative warmth of the climate of course render it well adapted for chronic rheumatism.

Gout is of somewhat rare occurrence amongst the inhabitants of the Riviera. All medical writers bear testimony to this fact. Attacks of course are sometimes experienced by English visitors who are subject to the complaint, and who bring it with them to the Riviera. These attacks are apt to occur in the spring of the year, being brought about by the comparative warmth of the climate, as well as by the somewhat trying diet and altered mode of living.

Even in such cases, however, the dry, bracing, stimulating climate of the Riviera after a time exercises a most beneficial effect. To secure its benefits, however, it is necessary that the patient should conform to the exigencies of the disease and of the climate, that he should live moderately, abstaining partially, if not wholly, from stimulants; be always warmly clad, take plenty of exercise, and avoid exposure at sunset and in bad and trying weather. The damp, sunless climate of England depresses the whole system, impedes elimination by the skin, and interferes with exercise.

Although it may be stated in general terms that the climate of the Riviera exerts a beneficial effect in most cases of gout, yet it is highly necessary that the nature of each case should be carefully discriminated. This point is strongly insisted by Dr. Baréty, who writes: 'It must not be forgotten that the arthritic diathesis exists in two distinct classes of patients. In the one the gouty tendency is accompanied by a remarkably impressionable nervous system; while in the other that condition is altogether absent. *The latter*, who may be spoken of as the calm, non-excitable

patients, are they in whom the gouty diathesis is, if we may be allowed the term, almost worn out, or in whom its different manifestations have much weakened the general constitutional powers. The excitable patients are more often women than men, and their nervous system is characterised by over-sensitiveness.' The slightest change of temperature, the least chill sets them sneezing and coughing, disturbs their digestion and their sleep, and makes them complain of pain in all their limbs. 'They are the patients who often find the tonic climate (of Nice) too exciting; who suffer, at any rate, when they first come South, from dwelling too near the sea.

'The process of acclimatisation is with them attended with much discomfort. They are apt to get sore throats, irritation of their air-tubes, and all sorts of cutaneous eruptions.'

The excitable class of gouty patients should not of course live near the seashore.

Although scrofulous affections are sometimes met with in the Riviera they are comparatively rare here, whereas in England one-seventh of the entire mortality of the country is occasioned thereby. Scrofula is a peculiar disease, and manifests itself under a variety of forms. Thus in many cases it is distinguished only as a more or less well-marked diathesis; in others, as scrofula without tubercle, and again, in others, by various forms of tubercular disease, as of the lymphatic glands, tabes mesenterica, phthisis, tubercular meningitis, hydrocephalus, tubercular peritonitis, &c. In this place I refer specially to the ordinary forms of scrofula, especially as occurring in young children. The chief predisposing causes of scrofula are hereditary tendency, food deficient in quantity, or unsuitable in quality, vitiated air, deficiency of light and warmth, particularly of sunlight and heat, and lastly, damp. Having regard to the climate of the Riviera it might be safely predicted that it would be highly favourable to such cases; and that it really is so is proved alike by statistics and experience. The effects, in the case of children, of the long, dry, bright, and sunny days of the winter season, during which they can be almost always out, taking exercise in the open air, not as in England under a leaden, but under a clear blue sky, is often really remarkable.

It may undoubtedly be affirmed that scrofula in all forms is benefited by the climate of the Riviera, including tabes mesenterica and affections of the nose, ear, and eye. In cases of scrofula the sea itself exerts a most beneficial influence, and hence a residence near the seashore will promote recovery.

It has been stated that the climate of San Remo, and of other places in the Riviera more or less similarly situated, is particularly adapted to young, delicate, or scrofulous children, and it has

generally been held that part of the benefit is derived in such cases from the saline matter, iodine and bromine contained in the air; Dr. Edwin Lee writes on this subject to the following effect: 'In speaking of the sea breezes, however, it is not to be supposed that I attribute any special effect to the marine atmosphere, which has been considered to exert such a powerful influence upon diseases of the lungs and air-passages; for the air on the shores of the calm bays of the almost tideless Mediterranean has been proved to possess no properties distinctive from land air, such as are possessed by that on the shores of the Northern seas, which, having tides and being mostly in a state of agitation, produce a certain amount of impregnation of the air with saline particles, which is often very perceptible to the senses.' In expressing himself thus, Dr. Lee is doubtless in error. The Mediterranean, as already shown, is not an altogether tideless sea, neither is the air on its shores calm, nor the waters in its bays free from perturbation; on the contrary, the shores of this inland sea are much exposed to winds, as are seashores elsewhere. The air here then, as in other places, is frequently perceptibly saline.

Dr. C. T. Williams expresses himself on this point in a contrary sense. Thus, he states: 'This stimulating character of the air is to be referred partly to the saline breezes coming from one of the saltest seas known, and partly to its dryness.'

Diabetes mellitus would appear to be one of those diseases which are but little influenced by climate: it is encountered everywhere, and I was informed by the late Dr. Burnell, the well-known Sanscrit scholar, that it is very prevalent in India, and especially amongst the Brahmins and other vegetable feeders. No death is recorded from this disease in the five years' statistics of mortality for San Remo, but it is stated that a case terminated fatally during 1882, and I have now under observation an Italian patient who has that disease. The information as yet obtained is not sufficiently exact and complete to allow of the determination of the effects of the climate on the disease. The late Dr. Sparks attended three cases at Mentone, all of which ended fatally. Two of these were complicated with lung affection, and the other case was that of a youth who died somewhat suddenly from this disease—as sometimes happens. Dr. Sparks writes of his cases: 'The climate did not appear to me to exert any special influence on any of the three cases; possibly it prolonged life a few months.' An advanced case under my care at San Remo for two years improved wonderfully. At the outset there was much emaciation, lung complication, and great prostration, the patient having also suffered from an attack of paralysis. In *fact,* when I first saw him my impression was that he had come

to San Remo only to die. However, he rapidly improved, gained much in flesh and strength, lost his lung symptoms, took daily exercise, and lived much as other people, though at no time did the diabetes wholly disappear. Unfortunately, when in England during the so-called summer of 1882, he caught cold from exposure; inflammation and consolidation of the lungs, with other complications, ensued therefrom, causing a fatal termination.

Having regard to the character of the climate and its ascertained effects in cases of ordinary phthisis, benefit might be anticipated in some cases of diabetes in which lung mischief had already manifested itself. Amongst others, Dr. Frank of Cannes, and Dr. Barety of Nice, both regard the climate of the Riviera as favourable in diabetes.

Diseases of the nervous system, and especially of the brain, are undoubtedly somewhat prevalent in the Riviera. The statistics of mortality from this class of diseases in Genoa, and to a less extent in San Remo, fully bear out this conclusion. Apoplexy and cerebral congestion, it has been shown by Dr. King Chambers, occasioned in Genoa 1 death in 12, whereas the proportion in London is 1 in 40 deaths.

The frequency of the occurrence of these diseases in the Riviera is attributed by the native medical men to the large quantities of brandy and other spirits consumed, and this cause no doubt helps much to increase the mortality; but there are yet other and more powerful causes at work. One of the chief of these is the dry and stimulating character of the climate; another the great power of the sun during the winter as well as the summer. The sun's rays fall upon the head with great power: the strong light passing into the eyes stimulates the brain to a degree and in a manner to which visitors from northern climes are but little accustomed. It is therefore very necessary that the head should always be well protected from the rays of the sun, and that the eyes should be screened from the strong and piercing light by the use of tinted glasses, and which are often needed for the protection of the eye itself.

The stimulating effects of the climate, the great heat of the sun, and the bright light not only rouse and excite the nervous matter of the brain itself, but the general, and still more the cerebral, circulation is powerfully influenced thereby, especially in spring and summer.

The climate, therefore, of the Western Riviera is not suited—(1) to those of a plethoric or sanguineous habit of body (2) or who have a tendency to cerebral hyperemia, (3) nor to those who have had either apoplectic seizures or (4) as a rule who have suffered from paralysis consequent on disease of the brain. Again, it is

not suited (5) to those whose arterial system is in an unsound state, and especially where degenerative changes in the coats of the vessels are in progress, such as sometimes exist in connection with contracted kidney. It is where such changes prevail, that the vessels of the brain, less supported than elsewhere by surrounding cellular and fibrous tissue, are apt to give way, and to become ruptured. Cases falling under any of the above heads should not on any account be sent here or elsewhere in the Western Riviera. The more sedative climate of the Eastern Riviera would suit them much better.

There is but little evidence to show how far other brain diseases are affected by the climate. Chronic hydrocephalus, being of a scrofulous origin and somewhat rare amongst the children of the San Remo and other inhabitants of the Western Riviera, there is reason to think, would, in the early stage of the disease, be materially benefited or possibly sometimes even cured.

Epilepsy would appear to be somewhat prevalent in the Riviera (Foderé), and persons suffering from that malady would be more likely to be made worse than better by the climate.

In certain cases of chronic degenerative disease of the nervous structure of either the brain or spinal system it is probable that benefit would ensue from a prolonged stay in a climate like that of the Riviera, as in locomotor ataxy and peripheric paralysis, the wasting palsy of Dr. W. Roberts, now known as progressive muscular atrophy. The amelioration would be due in such cases partly to improvement in the bodily functions from the operation of the climate, and partly to changes brought about in the seat of the disease, arising mainly from the absorption of the altered and diseased products. Dr. Barety states that the climate exerts a beneficial effect in cases of corea.

There is a general concurrence of opinion that disorders of the nervous system which are rather functional than organic are not only very prevalent in the Riviera, but also that they are aggravated rather than benefited by the stimulant climate. Many names might be quoted in support of this statement, as those of Foderé, Dr. Siordet of Mentone, and Dr. Frank of Cannes.

Under the head of functional disorders may be included that Protean malady hysteria, neuralgia, and insomnia, or sleeplessness. It is in the more exciting parts of the Riviera and near the sea that these disorders are apt to be most experienced.

I have met with several cases in which hysterical affections and tendencies have been aggravated. Dr. Siordet even states, in Sparks' 'Riviera,' that, in the more markedly hysterical, he has seen several cases of cataleptiform, epileptiform, and even *tetanic* convulsions, and he goes on to observe 'that this

aggravation of nervous disorders must be laid to the exciting effects of the climate. Both at Mentone and Nice I have heard also of some cases of maniacal excitement.'

Neuralgia is exceedingly common amongst the native population, and some winter residents are also very liable to be attacked by it. In many cases the neuralgia is associated with a carious condition of the teeth, and it is a common thing to see both men and women going about with their faces tied up, suffering from face-ache and neuralgia. In some cases these attacks yield readily to treatment; in others they are particularly obstinate, resisting every means which can be employed. Sometimes the patient, instead of getting better, grows gradually worse, and then the only thing is to recommend a change of climate, away from the sea and the Riviera. In a patient lately under my care the change of climate produced a magical effect; in a few hours after his departure he was entirely relieved of his sufferings.

Another occasional effect, as already noticed, of the climate of the Riviera, especially of the more exciting parts of it, is insomnia, or sleeplessness. This effect is due to the dry and stimulating character of the air; those residing near the sea are the most apt to suffer from it, partly because the air near the shore is drier and more affected and disturbed by the strong winds which prevail at times than more inland places. Hence it is advisable in cases of insomnia that the residence should be at some distance from the sea. It should be known, however, that persons coming to San Remo rarely suffer from insomnia, the climate being so much more sedative, in consequence of the air being less dry and stimulant, owing to the abundance of the evergreen vegetation surrounding the town, and the retentive character of the soil.

Dr. C. T. Williams, in reference to this subject, writes: 'It is probably to the stimulating quality of the air that the want of sleep so common amongst visitors is due. Patients seldom sleep so soundly as in England, and often only for a few hours of the night. Many take a siesta in the day. But evil results seldom follow from this wakefulness; for the nervous system, as Dr. Chambers remarks, being in a healthier condition, seems to require less repose, and refreshes itself more rapidly.'

Mental diseases are stated by Foderé to be rare in the Riviera, but, so far as I am aware, no reliable statistics on this head have yet been published. Having regard to the character of the climate, it may be predicated that it is very unsuitable for most cases marked by excitability. On the other hand, it would appear to be specially well adapted to cases of an opposite character, and attended with depression in place of excitement, as melancholia and hypochondriasis.

It follows from the prevalence of acute rheumatism that valvular disease of the heart and affections of the pericardium and endocardium must also be somewhat frequent, and that they are so is proved alike by statistics and by medical testimony.

In Genoa acute inflammation of the heart occasioned 1 in 44 deaths, and in London 1 in 606 deaths.

Now, if the climate of the Riviera be unfavourable in what must be regarded in very many cases as the primary and originating disease, it should also be so to some extent in the secondary disease. It is true the climate might exercise a beneficial effect in some cases of pericarditis, &c., by promoting the absorption of albuminous and fibrinous effusions and deposits, yet when the rheumatic diathesis is well marked there is always a tendency to the recurrence of attacks of acute rheumatism. The probability, therefore, is that more harm than good would result from a prolonged residence in the Riviera.

Then, again, there is another important point which must not be forgotten, and that is the hilly and mountainous character of the Riviera, and the more or less steep ascent which has to be made even to reach many of the houses. This circumstance is apt to put a constant, considerable, and very undesirable strain on the heart and circulation. It is essentially necessary, therefore, that persons coming to the Riviera with certain forms of heart disease—those of an obstructive character and dependent upon, or associated with, rheumatism—should pay particular attention to the advice of their medical man, and should conform themselves strictly to the exigencies of the place and climate as regards exercise, clothing, and weather. Exercise should be taken, as far as possible, on the level, all climbing up ascents being avoided. With these precautions, it is probable that much benefit might arise, even in some of the cases above referred to, from the generally beneficial effects of the climate on the bodily functions, secretion, absorption, elimination, and respiration. That many of such cases do well accords with the experience of Lebert and Siordet.

The degenerative diseases of the heart stand upon an entirely different footing, and with certain needful precautions are likely to be benefited by the climate—as fatty degeneration of the muscular substance of the heart in its early stage, and other alterations of that structure, the result of inflammation (myocarditis).

People who are fatter than is desirable are likely to lose a portion of their superabundant fat in the Riviera, and hence the climate has been recommended by Lebert for the obese who suffer from dyspnœa on over-exertion and in whom *there is an* accumulation of fat on the outer surface of the heart

(epicardium), and which might extend to the muscular substance itself.

Again, the climate is calculated to exert a beneficial effect in cases of simple muscular atrophy, dependent upon exhausting diseases, as diabetes, &c., as also in those in which, without atrophy, the action of the heart is simply weakened from general debility of the system.

Invalids and visitors coming to the Riviera for the winter season have little to apprehend from acute attacks of the organs of respiration. Colds are, indeed, not unfrequently caught by some if the weather should happen to be severe soon after their arrival and before they become acquainted with the precautions necessary to be observed, and before, in fact, they have become acclimatised. Such catarrhs, nasal or bronchial, are, however, usually nothing like so severe as they would be if caught in England, and they are, moreover, got rid of much more quickly. These colds are due, for the most part, to sudden chills.

Sore throats are also not of unfrequent occurrence, due sometimes to the same cause or to excessive dryness of the air.

'It is a well-known fact at Cannes,' writes Dr. Marcet, 'that after a succession of fine dry days there is an increase in the number of cases of sore throat, and that prescriptions for gargles and throat lozenges become very common at the chemists' at such times. This is probably due partly to the very fine dust floating in the air in dry weather, and partly to an excessive evaporation of moisture from the mucous membrane of the throat owing to the dryness of the atmosphere. This evaporation increases the secretion of mucus, and thereby promotes the flow of blood to the part, predisposing to congestion.'

Another troublesome affection to which there is a liability is tonsillitis, or quinsy; this is apt to occur particularly in those who have before suffered from this complaint, a further reference to which will be found under the head of diseases of the organs of digestion.

It has been shown that acute or inflammatory diseases of the organs of respiration, at least in the more exposed parts of the Riviera, as for instance Genoa, are of frequent occurrence among the native population, owing, not merely to sudden changes of temperature, but partly also to a variety of other causes, as exposure to bad weather, living in dark, sunless streets, insufficient clothing, and deficiency of nourishing food. Whether the same liability extends to the natives of the milder and more sheltered health resorts of the Western Riviera is not so clear, seeing that it is most difficult, and in some cases even impossible, to obtain statistics sufficiently minute and accurate for the purpose of comparison. There is some reason, however, to believe that the

same liability does exist although certainly to a less extent. In Genoa acute affections of the respiratory organs caused 1 in 9 deaths, and in London only 1 in 16 deaths.

It must be remembered, however, that visitors coming to the Riviera are placed under circumstances totally different to those with which the inhabitants have to contend, and that any risk which they incur is reduced, if ordinary precaution be observed, to a minimum. The risk in the case of invalids already affected with any disease is not so much that of liability to acute inflammation pure and simple, but, in the absence of care, to some congestive or subacute complications of lung affection already existing when they arrived.

On the other hand, there is a general agreement amongst medical authorities that chronic affections of the lungs, particularly phthisis and bronchitis, are far less prevalent than in colder and more northerly countries. Nevertheless, the statistics in support of this view are not so complete and reliable as could be wished.

So far as I am aware, the chief statistics bearing on the question of the relative frequency of phthisis in the Riviera are those quoted by Dr. Henry Bennet and Dr. Thorowgood.

Dr. Bennet has stated that the proportion of deaths at Mentone occurring amongst the native population is 1 in 55, in place of 1 in 5 (1 in 8 ?) as in Paris and London And this statement Dr. Bennet has informed me is derived from a work by the late Dr. Bottini, and which, being now out of print, I have not been able to procure. Before accepting it implicitly, one would be glad to be furnished with the precise details on which it rests, and, in particular, one would wish to know whether the certificates of death in each case were furnished by the medical attendant, or whether by a specially appointed medical man, 'medico necroscopo.'

The statistics quoted by Dr. Thorowgood in his 'Climatic Treatment of Consumption' are those of M. Richelieu, who practised for thirty-four years in the Riviera. He states that out of 7,000 deaths which occurred at Villafranca, Monaco, Mentone, San Remo, and other places on the coast, only 107, or 1 in 65, were due to pulmonary consumption. Here, again, further details are to be desired, though I fear they are not procurable. However, the figures in question are certainly not to be relied on. According to the official certificates, the deaths from phthisis alone at San Remo, out of the 1,412 deaths from all causes which occurred there during a period of five years, exceeded the total number of deaths from that disease in the 7,000 deaths reported on by M. Richelieu.

That these diseases should be of less frequent occurrence in

the Western Riviera than in the countries referred to is only in accordance with what might have been anticipated when the fact is called to mind that dampness of soil and air, one or both combined, have been found to contribute greatly to the frequency of the disease. The connection between dampness of soil and phthisis has been shown in a striking manner by the well-known inquiries of Dr. Buchanan and Dr. Bowditch. Dr. Buchanan's researches showed that phthisis is most prevalent on the alluvial soil of the beds of rivers, and on the soil of low-lying and ill-drained localities; while Dr. Pollock states, as the result of extensive inquiries amongst the out-patients attending the Brompton Hospital, that the valley of the Thames furnished the greatest number of sufferers.

With regard to this point Buhl[1] remarks: 'The majority of districts in which phthisis is very rife are distinguished by a high degree of atmospheric humidity, while, on the other hand, those places where it is rare are remarkably dry.' And again: 'As a fact, a large and constant amount of dampness of the air and soil gives rise to the phthisical constitution, and it is only the absence of exciting causes—*i.e.* rapid oscillations of temperature, which compensates for such an unfavourable relation.'

It will, in the next place, be well to point out the kind of cases for which the climate of San Remo and the other protected towns of the Western Riviera are best adapted.

A few preliminary remarks relative to the different forms and varieties of phthisis, and the essential character of the disease, will conduce to the better consideration of this important practical question.

Various classifications have been suggested of the different forms and varieties of phthisis. These are all more or less arbitrary; still, they afford sometimes useful practical information.

Thus, first, phthisis may be divided into hereditary and non-hereditary; the chief difference between the two being, that the former manifests itself at an earlier date, and, when fatal, terminates life at an earlier age. It is questionable whether the duration of hereditary phthisis is shorter, or whether it is more fatal than when not hereditary.

Another suggested division is into the tubercular and non-tubercular. Cases of acute miliary tubercle and perhaps acute phthisis with consolidation and excavation belong to the first division; and to the second, inflammatory phthisis, originating apparently from some acute lung affection, catarrhal phthisis, hæmorrhagic phthisis, laryngeal phthisis, ordinary chronic phthisis, and fibroid phthisis. These several forms do not constitute so many varieties or species of phthisis, but differ chiefly

[1] *Zwölfter Brief.*

in the anatomical lesions in each case. The same originating cause probably underlies them all, whether that be an accumulation of epithelial cells in the alveoli of the lungs, conjoined in the case of fibroid phthisis with an excessive development of fibrous or connective inter-alveolar tissue, whether it be due to a generation and infiltration of a specific tubercular matter, or whether the exciting cause is found in the bacillus of Koch.

In reference to the above divisions the opinion of Professor Charcot may be quoted. He affirms that the products of common inflammation, almost always present amongst the complex lesions of caseous pneumonia, are only a secondary result of the morbid process, and not the prime agents in the disease. And again: 'Nothing to my mind is better established than the existence of infiltrated or discrete tubercle as a fundamental element in the different forms of phthisis. On the other hand, nothing is more doubtful than the existence of caseous pneumonia independent of tuberculosis, and constituting the prime agent in the phthisical process.'

The above view is, however, not that which is generally entertained. Even true tubercle is regarded by some, as Buhl, as a secondary product of absorption of caseous matter by the lymphatics. The old dictum was that phthisis in every case meant tubercle, and that the disease never originated in simple irritation or inflammation. The modern view, and of course the more hopeful, is that some forms of phthisis do thus originate.

The following description of the changes which very commonly ensue in a case of catarrhal pneumonia is from the work of Dr. Pollock on the 'Prognosis of Consumption': 'Epithelial sheddings and exudation matter fill the alveolus; next the walls become thickened, and cells develop in the interior—cells which degenerate; and then the exudation matter is found in the inter-alveolar connective tissue, strangling the nutritive vessels of the lung, and you have a very different state of things, indeed, from that in crupous pneumonia, for when the degeneration period comes (and none of these products live long) we have the blocked alveoli, the walls, and the interalveolar tissue softened, ulcerated, destroyed, and the case becomes *phthisis*.'

Dr. C. Theodore Williams gives a similar description of the sequence of changes in a case of catarrhal phthisis in his work on the 'Influence of Climate in the Treatment of Pulmonary Consumption': 'A catarrh creeps down the mucous membrane, and eventually reaches some of the alveoli. Here rapid proliferation of epithelium (lymphatic endothelium ?) occurs, which is the more irritated and prone to multiply owing to the inhalation *of some of the* bronchial secretions. The alveoli become choked

and stuffed with epithelium, and the vessels may be emptied through pressure; ulceration may follow, and the whole mass may liquefy, caseate, and be expectorated. More commonly, however, caseation of the epithelium takes place, followed by absorption of the necrobietic material by the lymphatics. Thus the alveolar wall, with the perivascular lymphatics, becomes involved, and adenoid hyperplasia (that is, true tubercle) is the result.'

The exact part which the recently discovered tubercle bacillus plays in the causation of phthisis and its several anatomical changes and lesions has yet to be determined. When this has been done it is possible that some of the foregoing descriptions and views will have to be very considerably modified. Already it would appear that the so-called fibroid phthisis must be regarded as essentially distinct from the true phthisis, since the tubercle bacillus, according to several observers, is absent.

The question whether pulmonary consumption is in all cases a specific disease, or whether it is not very frequently non-specific, is a very important practical one, which has not as yet been satisfactorily determined. If specific, then the difficulties of cure would be enhanced; if non-specific, then the chances of recovery would be greatly increased, especially by hygienic and climatic means.

We are now in a position to consider the question of the kind of cases likely to derive benefit from the climate of the Riviera. They are as follows:—

1. Young people of either sex exhibiting a general delicacy of health and constitution, or in whom any hereditary tendency to phthisis exists. A few winters in the Riviera might so invigorate the system that the tendency would be entirely overcome.

2. Those in whom the disease is in an early stage; that of congestion or consolidation without softening.

3. Cases in which the disease is of small extent, limited to the upper part of one lung, and in which softening has taken place.

4. Cases in which the disease, though still limited, affects the apices of both lungs.

5. Cases in which the disease is extensive, but in which its progress has been slow and unaccompanied by high temperature. These cases are often met with in those who have passed the middle period of life.

6. Most cases of phthisis with a chronic tendency, and not too far advanced.

7. Cases which are stationary.

8. Most cases of phthisis occurring in persons past the meridian of life.

The cases falling under any of the above categories may be referable to one or more of the so-called varieties of phthisis of which mention has already been made, and the whole of which are usually benefited by a dry climate, other things being equal. Catarrhal phthisis Dr. Williams regards as an exception to this rule, and he considers it has been shown that this form of phthisis does best in a mild, equable, and moist climate like that of Madeira.

If by catarrhal phthisis is meant a form of phthisis brought on by repeated attacks of ordinary cold, then there is no reason why such cases should not also do well here. Colds in this climate are, as a rule, much less frequently caught, are less severe in character, and are very much sooner got rid of. Many who suffer in England from obstinate and repeated colds after a time rarely experience such attacks here. Of course, such immunity implies prudence on the part of the patient.

Dr. Barety is of opinion that chronic catarrhal affections, and chronic affections generally, especially when attended with profuse secretions, generally do well on the Riviera, and best when placed near the sea.

It has been often questioned whether hemorrhagic cases do well here. Of such cases there is every degree, from hæmoptysis to profuse hemorrhage from the rupture of a large vessel; the other concomitant symptoms and conditions also vary much as the extent of the disease and the degree of fever, so that it is not possible to lay down a fixed line.

There is certainly no reason why cases in which hæmoptysis has either occurred at the outset or in which blood-spitting takes place from time to time in the course of the disease, should not be sent to the Riviera; neither does the actual occurrence of more profuse hemorrhage act as a bar. What has to be taken into consideration in such cases is the extent of the lung mischief and the character of the accompanying fever. If the disease be extensive, and there is wasting fever, as shown by greatly increased temperature and profuse expectoration, the case is not suited for the dry and somewhat exciting climate of the Riviera. If such a case is sent abroad at all it is probable that it would do better in the more humid climate of the Eastern Riviera, or in that of Madeira.

With respect to hæmoptysis Dr. Thaon thus expresses himself:—

'When hæmoptysis is followed by fever and permanent pulmonary infiltration it marks the existence of a new development of tubercles; febrile hæmoptysis is therefore much to be feared.

'With respect to intercurrent hæmoptysis, we may say that *the climate of* Nice sometimes provokes slight hæmoptysis, due

to a general excitement of the circulation; but this is rare. Thus, of 154 phthisical persons we have seen but three attacked by hæmoptysis on their arrival, and this was never followed by fever. But we have noticed more frequently, towards the month of March, under the influence of a very low atmospheric pressure, a south-west wind, and a dry air, that a certain number o phthisical persons were seized with spitting of blood almost at the same time; these are known facts, and which Guéneau de Mussy has characterised as epidemic hæmoptysis.

'To conclude, we believe we are authorised to assert that the climate of Nice and of the Riviera is far from predisposing to hæmoptysis. Here are the figures which place this fact beyond doubt.

'We have been able to obtain exact information respecting 131 "poitrinaires" questioned about hæmoptysis; 91 had been subject to it in a marked form before their stay at Nice.

'At the end of one or several winters passed in this place we have only noticed 27 occasions of spitting of blood amongst the 131 patients. One may then affirm that the air of this place does not predispose to lung hemorrhage.'

This testimony is very important, and well nigh conclusive.

Dr. Marcet, who practised for many years at Cannes, is of opinion that patients with a tendency to hemorrhage should not take up their residence near the sea, and he believes that they do best on the hills, four or five hundred feet high, which skirt the Mediterranean coast; and in this opinion he is doubtless correct. When the hæmoptysis denotes congestion and the rapid progress of the disease, and is attended by high fever, then the neighbourhood of the sea would be decidedly injurious, and a more sedative situation should be sought.

The danger of hæmoptysis is greatly increased in warm weather; hence those who are liable to attacks of spitting of blood should not remain after the hot season has set in—say, after the middle of May.

The cases which most are agreed should not be sent to the Riviera are:—

Cases of advanced and rapidly progressing disease, accompanied by high temperature and wasting.

Very advanced and progressing cases, with secondary complications, as diarrhœa, and ulceration of the intestinal mucous membrane.

A certain amount of laryngeal complication would not be contra-indicative. The testimony of Dr. Thaon is as follows:—

'The action of the climate upon ulcerated lesions of the larynx cannot be doubted. We have witnessed very striking facts; we have seen ulcerations of the larynx cleansed more or

less rapidly, the secretion diminish, and the ulcerated surface after some months become cicatrised. We have met with 21 sufferers among whom laryngeal disorders constituted a veritable complication. Of 10 laryngeal catarrhs 7 improved, 1 case remained stationary, 2 became worse.

'Of 6 cases of ulcerated laryngitis, 3 were cured, 1 remained stationary and 2 became worse.

'Of 3 cases of ulcerated perichondritis all became worse.

'Of two cases of complete paralysis, one was cured and the other benefited.

'The "poitrinaires" attacked with laryngeal phthisis are well placed in the Mediterranean climate. Amongst many of them, the dry, tonic air exercises a local effect on the catarrhal process, and at the same time, by an amelioration in the state of the general nutrition, the infiltration has a tendency to reabsorb; but these good results are only attained by the greatest precautions on the part of the patient. Such invalids should choose a residence in the midst of gardens, far from the sea and from dusty roads; they should seek the sun but avoid the wind and damp.'

Dr. Barety thus expresses himself on this point:—

'In the majority of cases in which phthisis is associated with symptoms of laryngeal affection residence close to the sea is unfavourable; . . . but when the disease does not affect the lungs, but is chiefly limited to the windpipe, constituting what is called *laryngeal phthisis*, the neighbourhood of the sea does not appear injurious, and some patients have actually improved in that locality.'

With regard to the intercurrent diarrhœa of phthisis both Dr. Thaon and Dr. Barety may be quoted:—

'All the conditions favourable to the cure of tubercular diarrhœa are united in the stations of Nice and the coast of the Alpes Maritimes. . . . Of 32 cases of intercurrent diarrhœa observed at Nice we have noted 12 cures and 10 ameliorations.'

Dr. Barety affirms that 'diarrhœa is another complication in which the climate of Nice proves particularly beneficial. The same may be said of other forms of excessive secretion, as, for instance, excessive bronchial catarrh.'

Even some advanced cases of phthisis, with a considerable elevation of temperature and well-marked fever, often do well in the Riviera; the general health improves, the fever becomes moderated, and, if the lung mischief is not arrested, its progress will, at all events, be slower.

It is not intended to lay down hard and fast lines, or to do *more than* indicate in a general way the kind of cases which are

likely to derive benefit from being sent to the Riviera. It is well, as far as one reasonably can, to be hopeful, for it has happened to most medical men to meet with cases which, in spite of unfavourable symptoms, have yet, to the surprise of everybody, been marvellously improved, or have even got well.

Before deciding the question whether a case is a fit one or not for the Riviera, it is often desirable that the renal excretion should be examined for albumen, as the knowledge of the presence or absence of this, and the amount if present, will often afford much assistance in arriving at a correct decision.

That very many of the consumptive patients sent to the Riviera derive great benefit from the climate is unquestionable. The late Dr. Sparks endeavoured to ascertain by statistics the extent of the amendment, and the proportion of the cases benefited, and he arrived at the results embodied in the following table:—

Cases Treated in the Riviera.

		Per Cent.
Cured or improved . . .	1,208	62·6
Stationary or worse . . .	437	22·6
Dead	284	14·8

The 'cured' would doubtless be very small in proportion to the number of 'improved' cases.

Of 154 cases of phthisis treated at Nice by Dr. Thaon, 36 were cured, 47 improved, 19 remained stationary, 17 became aggravated, and 35 died. The particulars of those cases are set forth in the following table:—

	Died	Aggravated	Stationary	Improved	Cured	Total
Acute . . .	14	6	0	6	0	26
Sub-acute . .	3	5	1	10	1	20
Chronic with acute supervening .	8	5	2	11	4	30
Chronic with complications . .	6	1	12	13	10	42
Simple chronic .	2	0	4	7	21	34
Coming on at Nice	2	0	0	0	0	2
Total . .	35	17	19	47	36	154

The above results are to be regarded as very favourable, especially when it is remembered that many cases are sent to the Riviera in an advanced stage of the disease, and that the great majority remain for only one or two winters; in fact, for far too short a time to effect a radical and permanent amendment or cure. Had the cases referred to been sent earlier and remained longer, results still more encouraging would have to be recorded. It must

also not be forgotten that a portion of the benefits derived must be ascribed to the medical treatment adopted; and still another fact must be borne in mind—that in every climate, however unfavourable, with good food, shelter from bad weather, and proper medical care, a considerable proportion of cases improve, often to a surprising and unexpected extent.

For the purpose of comparison some statistics of the Royal National Hospital for Consumption and Diseases of the Chest at Ventnor, near the undercliff of the Isle of Wight, may now be cited. Of this hospital the author was the founder, and to its establishment ten years of his life were devoted. Its distinguishing feature is that it is upon the Separate System, each patient having a separate bedroom facing the South, and the whole establishment being conducted, as far as practicable, on the principle of segregation, in place of aggregation, as in the older hospitals. It accommodates upwards of 100 in-patients.

Of 2,482 patients admitted:

561 improved.
527 much improved.
636 very much improved.
184 restored.
238 stationary.
215 worse.
121 died = rather less than 5 per cent.

Accurate records were kept of the weight of 1,594 of the above patients, and it was found that they gained in weight during their stay in the Hospital no less than 6,069 lbs.

The above results are very striking, and prove the extraordinary benefit which the majority of those suffering from consumption and other diseases of the chest derive from change of climate, suitable diet, and appropriate medical treatment.

Cases of clergyman's sore throat, a follicular disease of the pharyngo-laryngeal mucous membrane, are not unfrequently sent from England to the Riviera, as much for rest and change as for the climate. Many of such cases do well here, but Dr. Barety is of opinion that such cases do badly near the sea. Cases of granular pharyngitis, he writes, do not do well near the sea, owing, he considers, to the fact that the neighbourhood of the sea tends to produce a state of congestion of the mucous membrane of the mouth and gums. 'That condition,' he writes, 'is invariably aggravated in proportion as persons suffering from it come near the sea, and as certainly gets better as they move further away from it.'

The choice of a residence in cases of disease of the organs of respiration is a matter of very considerable importance: if *the case* be accompanied by much fever and high temperature,

the patient should not live near the sea; but if, on the other hand, the case be chronic and unattended with fever, then the stimulating qualities of the sea air may prove particularly beneficial. In order to secure to the fullest extent the beneficial effects of any climate it is necessary that the invalid should avail himself to the utmost of its good qualities—that he should be out as much as possible, inhaling its pure air, and exposing himself to its warm sunshine. It is not enough, as some seem to think, simply to come to a place, and then to follow the bent of their own inclinations, without regard to the suitability of their surroundings and of the life they lead.

Thus, some invalids remain in bed too long in the morning, and get out far too late in the day, ignoring the fact that the early hours of fine days are the purest and most refreshing, and that in the Riviera the hours from 9 to 11 A.M. are frequently the calmest and least windy of the whole day.

Invalids, again, sometimes live in rooms with every window and door shut, with fires always burning, or frequent the crowded reading, smoking, or drawing rooms of gas-lighted hotels. Then they wonder much that they do not get better, and doubt whether their doctor understands their case and is treating them aright.

Again, others, usually younger and more energetic, expose themselves to other dangers. Thus, they are out in most unsuitable times and weathers; they over-exert themselves, take long and fatiguing journeys, perhaps make excursions to some of the neighbouring mountains, incurring thereby, if they be liable to hæmoptysis, the risk of a renewed attack.

Many patients seem to forget that the question for them is one of life or death, and, in place of throwing away or making light of their opportunities, they should settle themselves resolutely to the task of getting well, aiding the efforts of their medical man and following strictly his recommendations. If this advice were followed many lives would be saved in place of being lost.

While due attention is paid to air and exercise, the value of a suitable dietary, medicine, and medical care and resources must not be disregarded; and amongst the means placed at our disposal for combating pulmonary consumption is one to which the greatest importance is now attached in consequence of the recent discovery by Professor Koch of an organised and living parasitic production, to which the name of the Tubercle Bacillus has been given, and which is regarded by some as the 'materies morbi,' and by others as at least playing an important part in the pathology of phthisis. I allude to *inhalation*, practised partly with a view to the destruction of the bacillus in question.

It is true that inhalation in throat and lung diseases has long been practised, but this mainly for the relief of irritation, cough, or pain, but it is only recently that it has been resorted to for the specific purpose of destroying a living form peculiar to the disease.

Feeling convinced that the manner in which inhalation is even now usually practised was not nearly powerful enough to effect the objects in view, I have instituted some experiments with a view to determine the question.

The results of some of these experiments and observations were published in the 'Lancet' of May 5, 1883. They proved that the greater part, over four-fifths, of the antiseptic substances usually employed—as carbolic acid, creosote, and thymol—remained in the sponge of the oro-nasal inhaler, and that it was very doubtful whether any portion of them made their way into the lungs, and reached the seat of disease: even if they did so it was in quantities so minute as to be wholly insufficient to exert the smallest effect in arresting the disease. This, in some respects, is a discouraging statement for the thousands of sufferers whose hope is in the daily and persistent practice of antiseptic inhalation. Still, it is best that the truth should be known. Inhalation, then, as at present usually practised by means of oro-nasal inhalers for the purpose either of producing antiseptic effects, or of acting as a germicide, is absolutely of no utility whatever in cases not of throat affection, but of lung disease.

It does not follow, however, that the practice of the inhalation of antiseptics in phthisis and some other lung diseases should be discontinued. The fault is in the method, not in its aim and object. This object can, I believe, be effectively carried out by means of a properly constructed Inhalation Chamber, the air of which should be duly charged with the requisite antiseptics. In the construction of this chamber there are many points to be attended to, and some difficulties to be overcome. I am preparing such a chamber, which I propose to have ready for use at the beginning of the San Remo winter season of 1883.

A disease of the respiratory organs, second only in importance to pulmonary consumption, is bronchitis; indeed, it may be questioned whether it is not really more important, since the number of persons who in England die annually from bronchitis exceed by some thousands those who succumb to consumption. The average annual mortality for London from all causes for the ten years ending December 31, 1880, was 86,837; of this number 9,345 deaths were due to phthisis and 11,147 to bronchitis. Of these deaths a very large proportion takes place in

children under 5 and in persons over 60 years of age. Furthermore, the chief mortality occurs during the coldest months of the year, especially if rain or fog, with perhaps strong east winds, be superadded to the cold. This fact is shown very clearly in the mortality returns of the Registrar-General.

The reason why so many deaths take place in young children and old people is that the vital powers at those periods of life are less able to resist the depressing influence of great cold than when the body is in its full vigour.

Since, therefore, cold plays so important a part in giving rise to bronchitis, in intensifying the attack, and in bringing about a fatal termination, it may with reason be assumed that if people, and particularly the very young and the aged, could be placed in a climate mild and fairly equable they would be far less liable to be attacked with that disease, and, if already suffering from it, that they would be in the best possible position for its alleviation or cure.

That this is really so has been proved by experience; as also that the climate of the more protected parts of the Western Riviera offers all the conditions required. Its beneficial effects in cases of bronchitis are known to all medical men practising on this coast, and there are numbers of sufferers who can themselves bear favourable testimony to the great benefits they have derived therefrom. It cannot be doubted that the lives of many sufferers from bronchitis have been much prolonged thereby, while others have been entirely cured. I know of people who in England were each year placed in the utmost jeopardy from bronchitis, who now come to the Riviera each winter, passing the season in its dry, sunny, and moderately bracing climate in comparative health, being able to be out in the open air more or less nearly every day, and enjoying themselves much in the same way as their friends and neighbours.

Cases of bronchitis with emphysema also do well in the Riviera.

Notwithstanding the great mortality from bronchitis in England and other cold and variable climates, bronchitis is, under favourable conditions, a much more hopeful and curable malady than the disease previously referred to, namely, pulmonary consumption. It is not only that climate is more effective, but medical treatment also.

In Dr. Sparks' 'Riviera' the following appropriate observations occur: 'If we can place elderly persons in conditions of warmer temperature during the colder months of the year, we shall diminish or entirely remove the risk of their succumbing to bronchitis, and I am convinced that persons over 60, with the necessary means, and who show a tendency to this disease during

an English winter, cannot do better than fix their habitation from November to May in the more sheltered parts of the Riviera. I know several elderly people at the present time who are enabled to enjoy life there, and get out of doors nearly every day, while in England they have to shut themselves up the greater part of the winter, and even then get bronchial attacks of considerable severity.'

Another disease of the respiratory organs which is often materially benefited by the Riviera climate is asthma. The benefit is not confined to any one particular form of the complaint or stage of the disease, but all the forms and conditions may be, and often are, greatly relieved; of course in different degrees and for different reasons, the prognosis varying with the determining cause.

Thus, the asthma of young children, often the consequence of catarrhal pneumonia, may not only be greatly alleviated, but occasionally even cured.

The atrophous form of asthma, or that attended with an emphysematous condition of the lungs, usually does well in the Riviera.

As also cases associated with bronchitis, 'humid asthma.'

The cases of asthma arising from heart and kidney diseases are far less promising, but still they will often derive benefit from this climate.

Those cases likewise in which the attacks of dyspnœa are brought on by flatulent dyspepsia are frequently greatly relieved. The choice of a residence in this complaint is often a matter of much importance; some cases may do well near the sea, but the majority get on better at some distance from the shore, and on elevated ground.

I find the following remarks by Dr. Siordet in Sparks' 'Riviera': 'I think most of the cases of pure spasmodic asthma are unfavourably influenced by the climate of Mentone. Two or three very marked cases certainly, living close to the sea, have fallen under my notice. Cimiez seems to suit them far better; Cannes far from the sea much less well. The cases of asthma dependent on marked emphysema, and kept up by intercurrent bronchitis, &c., may do well at Mentone, as the exciting causes of the attack may be guarded against.'

It may be questioned whether any such disease exists as spasmodic asthma; that is to say, a purely spasmodic affection wholly independent of disease of the lungs. Certain it is that many cases of asthma which would formerly have been regarded as due to simple spasm are now found to be associated with, and to spring from, pathological conditions of the organs of respiration. *Dr. Berkart* is of opinion that every case of asthma is essen-

tially connected with some structural lung alteration. He thus expresses himself on this point: 'Hence the antecedents and sequelæ of asthma manifest themselves by their nature, as *one continuous though protracted pathological process. Asthma is therefore only one link in a chain of quasi-independent affections, which commences with inflammatory changes of the pulmonary tissue, and terminates with emphysema and bronchiectasis.*'

The one great requirement in the treatment of asthma is a constant, free, and often-renewed supply of pure fresh air. This in the house and in bed or sitting-rooms it is not easy to obtain; hence the necessity of being much out in the open air in the day-time, which is only possible, especially in the winter, in a suitable climate.

'In the winter,' writes Dr. Berkart, 'asthmatics should reside at places where the genial climate and the beauty of the scenery both permit and attract them to spend the greater part of the day in the open air. Although other circumstances, such as the relaxation from many sources of care and anxiety, the altered diet, &c., contribute to the benefit which is invariably experienced from residence at one of the numerous health resorts, still the main advantage of these is that they afford opportunities for out-door exercise at a time when, were the patient in his own country, he would most probably be confined to his room. In leaving home for the winter the asthmatic should therefore distinctly realise the object of his migration to a different clime.'

It has already been stated that the climate is well suited to those who are recovering from many severe and exhausting diseases, in fact, to convalescents in general. It is so to those who have recently suffered from acute affections of the respiratory organs, pneumonia, acute bronchitis, pleurisy, pleuro-pneumonia (either without or with effusion), and chronic pleurisy. A timely removal to a climate like that of the Riviera will often ward off many dangers, and ensure a more speedy and complete restoration.

It would appear that diseases of the organs of digestion are somewhat rife, and this is not only so in respect to San Remo, but the whole Riviera, and probably all South Italy. From some of the milder forms of those complaints visitors are by no means exempt.

Quinsy, placed usually amongst diseases of the organs of digestion, depends mainly on sudden exposure to cold, and would appear to be a very severe affection here; it certainly is of common occurrence. Visitors, especially new-comers, sometimes suffer from it, and if they were subject to it before coming here they would be very liable to a fresh attack.

Diarrhœa again, here as in England and most other countries, is credited with many deaths amongst the natives. This com-

plaint occurs chiefly at two periods of the year, spring and autumn, and may of course arise from various causes. Thus it may be due to atmospheric disturbance, to sudden chill, to unwholesome, or badly-cooked food, or to excess in the quantity and over-richness in the quality of the food consumed, or lastly it may be occasioned by impure water. *Apropos* of the liability of visitors to diarrhœa and certain other complaints, I find the following observations in Sparks' 'Riviera': 'It is generally the healthy visitors, *i.e.* those who accompany invalids or come out merely for amusement, who get laid up with these ailments (diarrhœa, tonsillitis, and mild naso-pharyngeal and bronchial catarrhs). Diarrhœa is very common in the early part of every season, if the weather is warm, and among those who are carried away by their appetites, and eat more animal food than is suited to the climate. It also occurs sporadically at all times amongst new-comers. Perhaps it may be then partly a result of chill, from want of acclimatisation and proper protection of the skin.' The testimony of Dr. Siordet, of Mentone, is to the same effect. 'The diarrhœa of new-comers is often due to fatigue and sudden change to comparatively warm weather, quite as much as to carelessness. I have known some troublesome cases amongst those who were merely travelling for pleasure, and spent a few days here on their way to Italy.'

Dysentery does not appear to be a very common affection, judging from the few deaths occasioned by the disease amongst the native population. I have not encountered a single case amongst the foreign visitors.

Tabes mesenteria, gastro-enteritis, and acute and chronic affections of the liver would appear to be common, as well as frequently fatal, diseases amongst the natives.

From the statistics given, and testimony to the same effect from other quarters, it may be concluded that the Riviera is not well suited for chronic gastric, and hepatic affections.

There is, however, a form of stomach disarrangement which does well here, namely, atonic dyspepsia. It has already been pointed out that the climate being warm and stimulating, the activity of the bodily functions is thereby increased, and digestion amongst other functions promoted.

According to Dr. Barety: 'Dyspeptic patients almost always benefit by a residence at Nice, the climate of which seems to exert a peculiarly favourable influence on tuberculous dyspepsia. Many patients, indeed, who when at home were victims to indigestion, which no remedy relieved, have regained here their appetite and renewed their strength.' On the other hand, the same author affirms that the sea 'disagrees with all in whom there is either a disposition to dysentery or biliary catarrh or *congestion of* the liver.'

Persons coming to the Riviera are very apt to suffer from constipation, and those in whom constipation is habitual are liable to have it aggravated, particularly in the absence of care and discrimination in diet and regimen. This constipating effect is due mainly, I believe, to the stimulant and tonic effect of the climate, but in a less degree also to the water consumed, much of which is very hard.

The prevalence of diseases of the organs of digestion amongst the natives is usually attributed to the kind of food consumed, and no doubt this has its effect, but I believe that the abuse of strong and crude spirits and bad wine exerts a much more injurious effect. But other causes doubtless play an important, probably a more important, part in the production of these diseases. One of these is the warm and stimulating character of the climate; but another, and I am convinced a very fertile cause of mischief, is a very general absence in the houses of the poor of those conveniences which in most countries are deemed essentials to comfort, cleanliness, and health. The few conveniences in the town itself are wholly inadequate, and they are for the most part in public and most objectionable situations. Again, other causes are the sunless streets of the old town, and in winter insufficient clothing.

It has already been stated more than once that chronic degenerative diseases are of infrequent occurrence in the Riviera. This remark is true particularly of the diseases of the kidney, commonly referred to under the name of Bright's disease. Thus, Dr. King Chambers states he did not find a single death in the statistics of the mortality for Geneva registered as due to disease of the renal organs, although anasarca occasioned 1 in 239 deaths in Geneva, the proportion in London being 1 in 93 deaths. No doubt some of the deaths attributed to dropsy were really due to Bright's disease; still the mortality would even then be but small. Dr. Dickenson gives the proportion of deaths due to Bright's disease in Genoa as 1 in 4,303 cases, and in London as 1 in 82, and in Paris 1 in 266.

In San Remo 1 death only is registered from Bright's disease and 25 from dropsy during the five years over which the statistics so often referred to extend. Some of these cases were probably due to kidney disease; but others, and possibly the majority, were occasioned by diseases of the heart and liver.

Dr. Griffiths, of Hyères, has informed Dr. C. T. Williams that no cases of Bright's disease have occurred in the Hyères Hospital within the memory of the present medical officers.

The above statistics are very far from complete, nor are they altogether reliable. While they are sufficient to show that degenerative diseases of the kidney are of uncommon occurrence,

they fall far short of supplying the data necessary for the accurate determination of the mortality from Bright's disease in the Riviera.

Although it may be said that the comparative absence of any disease from a particular locality does not afford a sufficient proof that the climate of that place is well suited to such disease when acquired in another country, and is capable of exerting curative effects, yet such absence renders it highly probable that the climate would exert a beneficial action. Again, when the character of the climate is considered—its dryness, freedom from extremes of heat and cold, the great amount of sunshine, and the ascertained effects of the climate in other degenerative diseases—but little room for doubt or question remains.

There is good reason to believe that dampness exerts a considerable effect in determining a more frequent occurrence of Bright's disease, as it has been shown to do in the case of phthisis. Thus Reimer, in his 'Klimatische Winterkurorte,' states Bright's disease is remarkably common at Madeira, both 'in combination with lung disease and independently.' Mittermauer observed it in 10 out of 28 post-mortem examinations at the hospital at Funchal, and he recommends that 'no patient who exhibits traces of this disease shall be allowed to go to Madeira.'

Now, the climate of Madeira is not only very moist but very warm, the annual temperature being several degrees above that of the Riviera. It would appear that cold alone is not one of the factors of degenerative diseases of the kidneys, though moisture and cold combined tend much to the production of the disease.

It is somewhat remarkable that but few cases of Bright's disease seem hitherto to have found their way to the Riviera, and hence the evidence of the effects of the climate on this disease is as yet very incomplete. The testimony most to the point is that of Dr. Frank, of Cannes, who, in answer to inquiries by the late Dr. Sparks, states that he has found the Riviera 'a very safe and advantageous winter residence in all forms of renal disease.'

Of the English sufferers from Bright's disease who come to the Riviera, but very few spend more than a single winter season there, and this is certainly in most cases far too short a time for the production of any radical improvement in the condition of the patient, or even to enable the medical man in many cases to pronounce a decisive opinion as to the effects of the climate. In order to obtain its full benefit, the patient should remain abroad for several successive years, not even spending the summer in England, but selecting some warmer and drier climate.

Of the seven uncomplicated cases of Bright's disease treated by

Dr. Siordet at Mentone, none remained beyond a single season, and therefore it is not surprising that he should write to Dr. Sparks that the climate 'seems to have had no result whatever, good or bad. Possibly a prolonged residence might have produced a different issue.' In one case, however, of four years' duration, the patient was enabled by the climate to take walking exercise, 'without which he was never well.' Of Dr. Sparks' three cases, one was associated with phthisis, and was really hopeless; the second, probably a case of parenchymatous nephritis, at first improved but afterwards got worse, owing apparently to the patient's own imprudence; while in the third case, 'complete recovery from dangerous symptoms has followed a residence of several winters in the Riviera.'

My own experience in Bright's disease is favourable to the climate. Of three cases under my care, one, a young Italian gentleman, died in the course of an attack of scarlet fever from uræmic convulsions, the kidney disease having pre-existed; in the second case, one of contracted kidney, occurring in an elderly man, great improvement took place, and life was prolonged for some years. This gentleman passed several years in the Riviera. The third case is that of a lady, aged about 30 years. She has been only one season in the Riviera, during which her general health has greatly improved, and there has been some reduction in the quantity of albumen.

Of course, in any chronic structural diseases, as of the kidney, the amendment would be at first scarcely appreciable, and much time would be required before the improvement would become very marked. Indeed, in such cases a careful quantitative examination of the renal secretion would have to be made before any opinion could be expressed as to whether any amendment or not had really taken place.

As might be anticipated from the stimulating action of the climate and the consequent increased cutaneous elimination, affections of the skin are by no means infrequent. These, however, are not usually of a grave character, nor are they to be regarded as an unmixed evil, since they are often the means of ridding the system of some morbid material, the retention of which might otherwise entail more serious consequences.

Amongst the minor skin diseases noticed, especially in the spring, the period of the greatest liability, nettlerash or urticaria, erythema papulatum, and herpes may be mentioned. Persons living near the sea, and those subject to skin attacks, are very liable to suffer.

I have attended several cases of herpes zoster in San Remo. The persons in whom this disease is prone to occur are usually nervous and excitable, with frequently an underlying gouty

disposition. The eruption is often extensive, and attended with much irritation and severe and persistent pain, usually aggravated by the warmth of the bed at night, thus simulating rheumatism. These attacks are more frequently traceable to chill than to excess in diet, although strict attention should be paid to both the quality and the quantity of the food and stimulants consumed. It is scarcely necessary to remark that those who are liable to suffer in the manner described should live at a little distance from the sea, as also should those who are the subjects of eczema or prurigo. With the precautions indicated as to residence and diet, patients often benefit materially in other ways from the climate.

According to Dr. Barety: 'Some chronic cutaneous affections, such, for instance, as those forms of acne which occur in gouty subjects, benefit decidedly by residence at Nice (and doubtless elsewhere on the Western Riviera), and even by residence near the sea.'

Scrofulous affections of the skin are also invariably greatly benefited by the climate of the Riviera, and those who suffer therefrom should live near the sea.

The great brilliancy of the light and the penetrating power of the sun's rays are apt to affect the eyes, and to over-stimulate and fatigue vision. In such cases the eyes should be protected by the use of tinted glasses.

Sometimes, however, the unaccustomed stimulation is of service, as in some strumous cases.

Occasionally, and especially in irritable gouty subjects, a congested state of the conjunctiva is brought about. Here relief should be sought in the use of coloured glasses and by selecting a residence away from the sea. In all inflammatory affections of the eyes residence near the sea is also contraindicated.

The opinions of certain authors on the medical aspects of the climate of San Remo may now be cited. These opinions will be found to be for the most part in accord with the views which have already been expressed in the preceding pages.

Dr. Prosser James in his work on the climate of San Remo and other Mediterranean Stations, for reasons which he gives in detail, but which need not be here reproduced, states that San Remo must be preferable to any of the other stations in certain cases. 'These are for the most part those for which the other localities are too stimulant. In the majority of cases of disease of the air-passages it is safer to try San Remo. In phthisis it is less likely to rouse into action hæmoptysis or any other tendency of an excitable temperament. Destitute of the depressing influence of Mentone, it is therefore to be preferred where debility *is prominent*. Those nervous cases which are not adapted

for the stronger air of Nice, all chronic exhausting diseases, general debility from whatever cause arising, will certainly do well here. When febrile symptoms come on at Nice, in short whenever the air is too stimulating, and in those cases in which it is feared to risk a winter there, San Remo presents the most eligible point; and to those who only need to escape the month of March, and its red moon, "luna rossa," it affords an accessible refuge.'

In the work of Dr. Edwin Lee on 'Menton and San Remo,' the following appropriate observations occur: 'The climate of this coast is particularly favourable to scrofulous patients, the disposition to its manifestation in young subjects being not unfrequently eradicated by its influence. The exciting property of the air imparts a favourable impulse to the functions of nutrition and sanguification, which are so faulty in this disease, and tends to rouse the torpid nervous energy, to promote the dispersing of glandular swellings, and to remove other local consequences of this diathesis.' 'Disorders of the digestive organs characterised by debility or torpor would most likely be benefited by the climates of this part of the coast.' 'The preceding observations as to the effect of climate in dyspepsia are equally applicable to hypochondriasis and to some other atonic nervous affections, whether accompanied or not by material visceral derangement.' 'Gout and rheumatism are diseases in which the beneficial effect of a warm, dry winter climate is most decided.' 'Many persons subject to gout may consequently escape their periodical attacks, or have them in a very mitigated form by passing the winter in a locality where daily exercise can be taken, and where the air, warmed by the sun's rays, promotes a freer circulation and an increased secretion from the skin, to the great relief of the internal congested organs. The same influences produce a no less favourable effect in most cases of chronic rheumatism, which are usually caused by the combined action of cold and humidity.' 'The same may be said of calculous complaints, which are very rarely met with among the natives along the Riviera.' 'Paralytic patients mostly derive great advantage from being in an appropriate winter climate.' 'When paralytic symptoms supervene upon attacks of gout or rheumatism, upon exposure to cold or damp, to malarious emanations, or to other causes not referable to cerebral lesion, a complete cure may often be effected by the combined agency of climate and mineralised baths.' 'Many clergymen suffering from a relaxed state of the system, with affection of the throat and hoarseness or otherwise impaired health, from over-exertion or from residing in an insalubrious district, annually resort to the stations on this coast and obtain a restoration to health and strength from the influence of its climate and

the cessation of active duty.' 'As respects diseases of the respiratory organs, a winter sojourn at one or other of these stations is found by experience to be eminently beneficial, and in the less serious and long-standing cases often suffices to produce a cure; in others a decided amelioration may confidently be expected, provided no unforeseen circumstances should arise by which the beneficial influence of this climate would be neutralised, and provided the cases be of a nature to which this kind of climate is best adapted : namely, such as are marked by the absence of general or local excitability and of a tendency to active hæmoptysis.' 'To most of these patients, Menton or San Remo may be recommended.' 'The climate of these stations would likewise be beneficial in most cases of humid asthma without inflammatory complication, occurring in patients of a torpid or lymphatic habit; it is, however, generally unsuited to the nervous form of this disease. A residence at some distance from the sea is mostly preferable for asthmatic patients.'

Supposing San Remo to be selected as the winter station, a few words may now be bestowed on the choice of a residence. The east and west ends of the town have already been described in part, and some of the differences between the two pointed out. The west end stands on high ground with but little level space between the sea and the hills; and is provided with a handsome promenade elevated many feet above the shore. At the east end of the town there is more land on a level with the sea, well covered with olive trees; the high or Genoa road, on either side of which the houses are built, runs at a considerable distance from the shore, a view of the sea being scarcely obtained until the Victoria Hotel at the easternmost extremity is reached. There is no esplanade here.

The west end of the town, from its elevated position, is the cooler and fresher, and being closer to the sea is more exposed to the winds. It is also drier and more hilly, so that in order to reach some of the houses it is necessary to make a considerable ascent. This last consideration is one of much importance for persons suffering from chest affections.

The east end of the town is warmer, more on a level and more sheltered from winds coming from the sea. It is, however, less dry, and it lacks the freshness and cheerfulness of the west end, owing to its distance from the sea and the absence of a promenade.

The above particulars furnish some information as to the position to be chosen for a winter's residence, which of course must depend to some extent upon the nature of the case. Houses near the shore are liable to suffer from the noise of the sea at *times*, are much more exposed to winds, and the air is of a more

exciting character: whereas those houses which are more inland are less subjected to noise and wind, especially if they be surrounded and protected by olive trees or other vegetation, and the air will be far less stimulating or even sedative, according to the distance from the sea and the nature of the surroundings.

Persons therefore of an excitable or nervous temperament, or who suffer from sleeplessness, ought not to reside near the sea but in localities more inland; those, on the contrary, whose temperament is lymphatic, and who are able to bear a dry and exciting atmosphere, will be better placed near the shore.

Were a proper esplanade constructed by the sea, extending from the end of the Via Ruffini eastward, the character of the east end of the town would be entirely changed; it would become drier, fresher, and brighter, although it would still retain its warmth and shelter; in fact, it would then be far better adapted for the residence of invalids, and the value of property there would be speedily increased. At present the majority of the English reside on the west side of the town, and while there is scarcely a villa to be let there, some houses usually remain unlet at the east end. The great need on the eastern side is an esplanade, and an effort ought to be at once made for its construction. Towards the cost, the landowners, landlords, and hotel-keepers should largely contribute, as it would add so materially to their prosperity. What can be done in this way by the enterprise of a single individual is shown by the small portion of an esplanade which has been constructed in the rear of the Victoria Hotel. I feel certain that it needs only a united effort to ensure the construction of this much required eastern esplanade.

But the opening up, by the formation of good and easily accessible footpaths, of some of the sheltered and lovely little valleys lying on either side of the town is almost as necessary as the construction of the esplanade. There is hardly another town to be met with which has in its immediate vicinity so many valleys offering beautiful walks and the most grateful shade and shelter, and yet so far as invalids, visitors, and indeed it may be said, the general public, are concerned, these valleys are for the most part of little use for the purposes for which in a health resort they are so specially adapted. There is scarcely one of them which can be entered on a level with the town or which possesses a good, clean footpath. To get at some of these valleys it is necessary to enter, not as might be imagined from below the hills, but from the top, to reach which ascents altogether beyond the powers of invalids, and indeed of many persons who are not incapacitated by sickness, have to be made. Of the invalids and visitors who come to San Remo, it may be affirmed there is not

one in fifty who has any knowledge of the extent and beauty of these valleys.[1]

A great and almost fatal mistake has been committed in not preserving a proper right of way by the seashore and also through each of these valleys; obstructions have been allowed to spring up in all directions, which render the accomplishment of many of the improvements so much required not only difficult, but vastly more expensive than they otherwise would have been. Such thoroughfares would be not merely non-injurious to private rights, but while they would improve the town and add to its attractions, they would also immeasurably enhance the value of property, not only near the sea but along the course of the valleys.

It is not enough that San Remo should possess a good climate comfortable houses and excellent hotels, but it is necessary that suitable walks, promenades, and drives should be made, adapted alike for exercise, pleasure, and health. These it cannot be said that the town now possesses to anything like an adequate extent. San Remo has doubtless been much improved of late years, and it now possesses most of the requirements of a health resort; still its rise has not been so rapid as it ought to have been, nor will it be so in the future, as long as the above and certain other very obvious deficiencies continue to exist. Very many of the improvements made have reference to the construction of additional houses and buildings in the town and neighbourhood, and which are calculated to produce an immediate return on the outlay involved; but in the case of a health resort it is often advisable to spend money in advance on necessary improvements, with a view to a future but equally certain return; to sow, in fact, seed, that later an abundant harvest may be reaped.

Now it is evident, from all that has been stated of the climate of San Remo, that invalids in order to obtain all the beneficial effects which it is capable of exerting, as well as to avoid some risks, should strictly observe certain rules and precautions.

The following are the principal of those precautions:—

It follows from the great power of the direct rays of the sun shining through an atmosphere usually free from clouds and moisture, that a very considerable fall of temperature must always be experienced on passing from the sun into the shade.

The difference which exists between the heat of the sun and the temperature of the air in the shade is not always solely due

[1] It is right to state that since the preceding paragraphs were written four of the valleys have been opened up by the construction of carriage roads, the Foce Valley at the west end by the construction of the Berigo road and the Bestagna, San Francia and San Martino Valleys at the east end of the town. The formation of an eastern esplanade has been much talked of, but there is at *present no sign* of its being commenced.

to the deprivation of the direct solar rays, but in part also to the great coolness of the air when the wind comes from the north, it passing over in its course snow-covered mountains:—

With a view to guard against any ill consequences which might result from sudden variations of temperature, I indicate and strongly recommend the following precautions:—

In the first place it is essential that invalids should not expose themselves to the direct rays of the sun without the head being protected by a sunshade, and in the next that they should avoid as far as possible passing too suddenly from the sun to the shade, or remaining in the latter for any length of time, as for example by stopping to converse in the streets.

This precaution is specially recommended when the wind is high and comes from a cold quarter, for it is under such circumstances that chills may give rise to serious colds.

With a view to guard still further against variations of temperature it is necessary to wear warm clothing.

I have always recommended those who come to pass the winter here or anywhere else on the north shore of the Mediterranean, to bring with them the same clothes they are in the habit of wearing in England. I advise even those who do not usually wear flannel to do so here.

Towards the end of the season, that is to say in April and the commencement of May, certain changes may be made in the outer but not in the under clothing.

With the same object in view, of guarding against sudden changes of temperature, one ought not to neglect before going out to take upon the arm a shawl or some other covering in readiness to put on should the necessity arise. Persons driving in open carriages ought not to forget to have with them a sufficiency of warm wraps. The San Remese, like the rest of the Italians on this coast, even in fine weather during the winter season are accustomed to carry with them a coat or shawl to be used in case of any sudden change of temperature, and it is not an uncommon thing to see men enveloped in shawls like those worn by women.

Although it is necessary to be thus careful at times, yet there are few days during the winter season on which even an invalid may not go out and take exercise in the open air; the spot being well protected, he can often sit out for hours basking in the sunshine. Invalids should, however, be most careful about sitting out of doors, and only do so in suitable weather and in sheltered situations.

Again, invalids should never be out near to or at sunset, as if the day has been bright and sunny and the sky clear, there is, as has been clearly demonstrated, a considerable fall of tempera-

ture accompanied by a copious deposition of dew, which renders the air damp and chilling for a time. Later in the evening the air often becomes drier and warmer.

They should also be very careful not to be out in very high winds or when the air is damp from recent rains.

The effect of the sudden vaporisation of the rain or other sensible moisture in absorbing caloric and so lowering the temperature is thus described by Dr. Marcet: 'After a heavy rain in the afternoon with an easterly wind, it is not uncommon to observe the wind shifting to the north-west, and in the course of a few minutes the dark leaden sky is cleared of its heavy clouds, while the air which was saturated with moisture rapidly becomes dry. It follows that a considerable evaporation from everything exposed to the air takes place, thereby creating an accession of cold. This cold is actually due to the absorption of heat required by the water in order to assume the form of vapour, and the absorbed heat is taken up from the objects on which the water rests,' as the earth, vegetation, &c.

Winds also abstract heat, and in some cases, when the air is dry, moisture also, from the various objects with which they come into contact.

Delicate persons, and indeed all those who are suffering from affections of the chest, should occupy only south rooms in the winter. The difference between a south and a north room may almost be compared to that between summer and winter. It is in December, January, and sometimes part of February, that the cold is chiefly felt, and particularly at night, but even then the temperature of a south bedroom will seldom descend below 50° Fahr., and is usually much higher. The mean difference at San Remo during the winter season between the day maximum and the night minimum temperature is only 12°, and this of course out of doors.

The temperature of a north room in the daytime is several degrees below that of a south room, even when the sun is not shining, but the difference will of course be very much greater when the sun is upon the latter. The same holds good to some extent even at night. In winter on the coldest days, when the sun is shining on a south room it will be warm enough to allow of the door or window being thrown open, and the temperature will remain during the fine part of the day usually above 60 degrees.

Although the occupation of south rooms and especially of a south bedroom is essential in the case of most invalids in the winter, yet in advanced spring and summer the reverse holds good, because then the nights and days become almost equally warm, and the night temperature may be at times somewhat

enervating. At such times, healthy people often find themselves more comfortable in a north room.

Care should be taken that the bedroom be spacious, airy, and well ventilated. If, as is generally the case, it possesses a fireplace, the ventilation is in a measure ensured thereby; but if not, and the door be in a favourable position, it would be advisable to keep it more or less open, even if only to the extent of an inch or two. Some writers recommend sleeping with the window open; this, however, is a proceeding to be adopted with great caution, two or three inches only being opened and the window covered with a light blind or curtain. But even the partially opened and guarded window is often only suitable for the warmer nights of autumn or advanced spring.

We read in books that many invalids in some health resorts sleep with open windows, and from the manner in which the subject is treated one would suppose that the windows are kept wide open as in the day; but that is a great mistake, for such a proceeding would be very unsafe. When therefore open windows are spoken of, a small portion only of such windows is meant; about two or three inches, according to whether the windows are guarded or not by persiennes or curtains. To sleep with a partially opened window is a custom much to be recommended, and it is to be regretted that it is not more generally adopted. French and Italian windows are particularly well suited for the purpose.

Another precaution has reference to diet. The climate of the winter season, with the exception of December and January, may be described as a warm one; the diet, therefore, requires to be considerably modified. The highly nitrogenous diet, the heavy meals and the strong wines of cold northern climes, are altogether out of place, and cannot long be tolerated without evil consequences ensuing—indigestion, headache, and sleeplessness.

Over-fatigue should be scrupulously avoided, no long excursions undertaken, and, above all, if the lungs be affected, climbing up the hills and mountains should be absolutely forbidden. Much mischief constantly ensues from a neglect of these precautions. There are so many beautiful excursions with such lovely prospects, that invalids are often tempted to exceed the bounds of prudence.

There are no more suitable walks for invalids than in the olive groves and valleys; in these the air is nearly always warm and still. Even on the most gusty days scarcely any disturbing wind penetrates to these spots, but the difficulty is to get at them without having to make a greater or less ascent. For those who occupy villas high up, there is happily tolerably easy access to the olive groves, while, for those on the western side of

the town there is the recently formed, pleasant, and well-sheltered Berigo road.

There are very many excursions available for invalids by the aid of donkeys, but the majority of these should only be undertaken in warm and fine weather.

For a full account of the walks and rides, the reader is referred to the succeeding chapter.

'During the colder part of the season,' wrote Mr. Aspinall, 'it is of course desirable to keep low down in the valleys amongst the lemon and orange groves, where you can always have warm, sheltered walks, and where you may saunter for hours without a breath of wind touching you; at one time surrounded by orange and lemon trees with their golden fruit, while at another the olives, with their silvery foliage and picturesque old trunks, shut out all further view, except here and there a peep of the deep blue sky—and what a sky! Then again you catch a glimpse of the lovely sea, or a view of a valley, or a portion of the quaint old town, or you come upon a group of palm trees.

'But the time for the most thorough enjoyment of the country is during the spring months, when the groves are alive with birds and insect life, and when the terraces and places are literally carpeted with flowers, some of them quite dazzling from their brilliancy; flowers, many of which in England ornament our greenhouses, but here grow wild in the richest profusion. This is the time for the more distant excursions, when you can take your lunch with you and spend the greatest part of the day in the open air. It is now warm enough to leave the olive groves and ascend to the pine regions, from which the views of mountains, hills, valleys, and sea are glorious beyond description.'

The questions are frequently asked, How soon ought persons to arrive at San Remo for the winter, and at what period should they leave? These questions have often been answered, but not always in the same way. I will now reply to them in accordance with the opinion I entertain myself.

First, I recommend the intending visitor not to delay his departure from England too long, lest he take cold and his health be injured, but to leave it by the 1st of October, even if he do not come straight to San Remo, but spend a few days on the way; reaching it not later than the middle of the month, by which time the autumnal rains will usually be over and a period of dry and fine weather may be expected.

With respect to quitting San Remo, this should be postponed as long as possible, and it should certainly not take place earlier than the middle, or, better still the end, of May. The weather during the spring and early summer is usually most beautiful and *enjoyable*, being by no means hot. It is in the spring months

that the patient usually derives the greatest amount of benefit from his sojourn abroad; it is then that the weather becomes fine, bright, and warm, and the days long, so that he can be constantly out of doors with advantage; it is then that all nature awakes with renewed life, and the earth, the hills, and mountains become clothed with new beauties, imparting endless pleasure to the invalid in his walks and excursions.

Most people make two great mistakes; first, in arriving too late at San Remo, and second, in leaving for England far too early. Many act as if their only object in coming was to escape the rigours and trials of an English winter, and seem altogether to forget that further and still more important object, a radical and permanent improvement in their health, which can only rationally be expected as a consequence of a prolonged sojourn, and this under the most favourable conditions of climate and weather. No sooner do the early signs of spring show themselves, than very many persons begin to grow impatient and hasten their return home, ignoring the fact that although the weather here may be bright and sunny, it is still cold, cloudy, and even wintry in England. Remember that on the 1st of May, in or near London, there are scarcely any flowers in blossom even of the commonest kinds, not enough in fact to meet the requirements of the so-called 'Garland Day;' even the 'Derby' has been run in a snow-storm.

The result of this imprudence frequently is, that all the good derived from a residence at San Remo is wholly undone. The fact should not be forgotten that persons who have spent the winter in a climate such as this, are, for a time, still more susceptible to the effects of cold weather than they would have been had they not come here at all.

To spend only three or four of the severest months of winter in the Riviera, especially in cases of consumption and bronchitis, and then to return home to the same conditions and surroundings under which their maladies have arisen, expecting at the same time that their short stay will result either in a great amelioration or even cure of the diseases from which they are suffering, is certainly most unreasonable. I am convinced that were a different proceeding adopted and were sufferers from lung disease to prolong their sojourn abroad in suitable localities for several years both winter and summer, a large proportion of those who now ultimately succumb might be saved and their lives prolonged to a good old age. The plan now pursued of going abroad for a short winter and returning to England or other countries with a climate equally variable and cold for the rest of the year, is thoroughly wrong, and stops far short of what is required.

The time spent therefore at San Remo in cases of lung disease,

to which our remarks more particularly apply, should not embrace a period of less than seven months, but it would be better still if the time were prolonged to eight. The Cannes season lasts eight months, and houses are usually let for that period, that is, from the 1st of October to the last day of May. At San Remo the Villas are generally let for the short term of six months and a half, people being expected to arrive about the middle of October and to take their departure by the 30th of April, or at latest the 15th of May. For this there is no sufficient reason, and much may be said against it. The climate of San Remo is comparatively cool in the spring, and at the end of April it is certainly unsafe for most invalids to return home. Besides, the charges made for furnished houses are amply sufficient to cover a longer period than six months, and we would advise those who intend to take houses to insist on a term of seven months at the least, and not to pay extra rent after the end of April, as some have had to do. After April is over there is but little chance of the proprietors re-letting their houses, and the precise date at which the tenancy terminates can really be of little consequence to them.

The climate of San Remo, as we have seen, fulfils nearly all the reasonable requirements of a health resort, still it is by no means perfect, neither does it fulfil all the expectations formed by the sanguine. There is in fact no such thing as a perfect climate to be met with on the face of the earth: there must be winds, rain, sunshine, clouds, and variations of weather everywhere. An unvarying climate would be anything but health-giving. If, however, San Remo be deemed too cold and variable, the question becomes pertinent, where is a more suitable climate, particularly for diseases of the chest, to be met with at a reasonable and accessible distance from England and the north of Europe?

It is certain that no place in the south of France or Italy possesses advantages superior, or on the whole equal to, those of the more sheltered portions of the Western Riviera.

But the question of a Summer Resort is scarcely less important than that of the winter residence; it is not proposed, however, to enlarge on this subject or to indicate on the present occasion any particular places, but merely to state in general terms the characteristics of a summer health resort, suitable for the majority of phthisical cases.

The air should be dry, cool, moderately equable, but not cold; and the difference between day and night temperature should not be too considerable; the situation should be sunny, the sun neither reaching it too late in the day nor leaving it too early, as is the case with many of the mountain health resorts, now in fashion; *the elevation* should not be too great—two, three, or at the most

four thousand feet. I have known persons who have been sent to the Engadine, suffer greatly in their breathing, even in summer, from the rarefaction of the air at that elevation, the difficulty being further increased by the great difference between the day and night temperature, and the cold of the early morning and afternoon as contrasted with the almost tropical mid-day heat.

This chapter cannot be more appropriately concluded than by the following quotation. I was much struck on reading it with the close resemblance of San Remo in almost every particular to the picture of an hypothetical Atlantis for Consumption, so well drawn by Dr. Richardson: 'It should be near the seacoast, and sheltered from northerly winds; the soil should be dry; the drinking water pure; the mean temperature about 60° Fahr., with a range of not more than 10 or 15 degrees on either side. Extremes of dryness and moisture are alike injurious. It is of importance, in selecting a locality, that the scenery should be enticing, so that the patient may be the more encouraged to spend his time out of doors, in walking or riding exercise.'

Perfection is not to be expected in anything sublunary; and, as the Italians say, 'Ogni medaglia ha il suo riverso.'

APPENDIX.

WALKS, DRIVES, AND EXCURSIONS

IN AND AROUND

SAN REMO.

WALKS, DRIVES, AND EXCURSIONS.

No one can form any idea of the exceeding beauty of the environs of San Remo who has not stayed there long enough to explore some of its valleys and mountains and so beheld some of the most beautiful of its scenery; neither without such exploration can any just opinion be formed as to the resources which San Remo offers to the visitor and the invalid, or of the completeness of the mountain shelter which it affords. It is with a view to make apparent the extent, variety, and beauty of the excursions in and around San Remo and to render the topography of the neighbourhood more easily understood, that I have myself made a considerable number of excursions, the chief features of each of which will be found described in the following pages. Mere descriptions of walks and excursions on paper are not easily followed unless the places themselves be visited; when they are so, details which may otherwise seem confusing and difficult to follow, become clear and easy. If it be recalled to mind that San Remo occupies nearly the centre of a considerable area surrounded by mountains, gradually increasing in height towards the north, from the Capes east and west of the bay, that a number of valleys originate from the sides of these mountains, running towards and terminating near the sea, and that these are separated the one from the other by a series of long hills or ridges, each with its chapel, the key is afforded to the topography of the district, and it becomes evident that the arrangement is of the simplest kind, and that little difficulty need be encountered in finding one's way about and making most of the trips described, without the aid of a guide. The excursions may be divided into those on the east and those on the west of the town of San Remo, the centre of which is crowned by the Madonna della Costa. The valleys to the east of the Madonna succeed each other in the following order: The San Francia Valley, the Bestagna Valley, the Martino Valley, the Vallée des Oliviers, the Valley of Ceriana, and the Valley of Taggia. Those to the west of the Madonna are the San Romolo Valley, the Foce Valley, and the Bernardo Valley.

Since my work on 'San Remo and the Western Riviera' was published several new and important carriage roads have either been completed or are in course of construction, and they necessitate alterations in some of the descriptions given in the work above named. The excursions to the east will first be given.

THE SAN FRANCIA VALLEY.

The Via Francia—The Strada Francia—The Chapel of San Giovanni—The Olive Mills—The Chapel of San Michele.

The first valley to the east of the old town and of the Madonna della Costa is that of San Francia. The termination of this valley is at the eastern end of the Via Palazzo, where the road crosses it, here formerly bordered by an iron railing, but now by a high wall, which shuts out all view of the valley. On looking over this, a small torrent making its way to the sea, and as usual the receptacle of all kinds of refuse, is seen, as also numerous Lemon trees; but no way of access to the valley, strange to say, exists at this point, although a broad, dry, level footway here would be of the greatest possible advantage to the inhabitants and especially the invalids who resort to San Remo. To enter the valley from the west side it is necessary to make a considerable ascent and to climb up through the old town to the Madonna della Costa, emerging at the Candelieri gateway. On the east side, however, it can be approached more on the level by the Via Francia, which commencing at the Church of the Angels, and running in a straight line for a little way then divides into two brancl es, one inclining to the left traverses for a considerable distance the east side of the valley, there crosses it by a handsome stone bridge, the road turning abruptly to the left and following the west side of the valley in the direction of the old town and the Madonna della Costa, a little way below which it passes. It is intended that this road shall be carried across the San Romolo Valley and be made to join the Berigo road to be presently noticed. It is also proposed to connect the San Francia Valley road with the Strada Peirogallo. When these several roads are completed a continuous drive may be taken from the commencement of the Berigo road near the West End Hotel right away to Verezzo, a very long drive, full of charming views and scenery. Near the new bridge referred to above there is a very picturesque Olive mill with three aqueducts, two of which cross the stream at a considerable height. The other branch of the Via Francia turns abruptly to the right, and, passing behind the *Hôtels de* Nice and d'Angleterre, ends in the Rondo.

Just behind the Madonna della Costa, the pathway divides into two, one branch continues onwards nearly in a straight line on the top of the ridge which separates the San Romolo from the San Francia Valley, and which leads to San Romolo and Monte Bignone; the other bears a little to the right, and in the angle between the two is a small house. Follow this path for a few minutes, when on turning round a fine view is obtained of the sea, of Capo Verde, surmounted by the Madonna della Guardia, and of the mountains forming the eastern boundary of the San Remo amphitheatre. Continue on for about half an hour, taking care not to leave the path for either of the two footpaths or the mule-path on the right which lead down into the valley; at the end of that time the road turns down towards the stream, which is here crossed by a two-arched bridge. After proceeding for a short distance along this path, the garden of Monsieur Corrado is noticed, within the centre a rustic summer house, commanding a fine view, and it bears on the top the words 'Via a Valromita.'

Soon after leaving the Madonna della Costa and looking down into the valley through the gaps in the Olive trees, a great many Lemon trees, laden with fruit, are visible, some fine groves of the same skirt the path, as well as many Almond trees, now on the 7th of March in full blossom, their delicate pink colour standing out in striking and pleasing contrast with the dark green of the Olive trees. So abundant are the Lemon trees that this valley might well be called a Lemon Valley. Everywhere the ground and in some places even the walls are blue with violets. Although these have been daily gathered in immense quantities for more than two months, the supply shows no sign of being thinned, but appears to be practically inexhaustible. Another plant of which many specimens are seen on the way, is the small or indigo blue Grape Hyacinth, Muscari botryoides. Here and there are large patches of broad beans in full blossom, scenting the air with their sweet perfume.

The view of the lofty hills on the other side of the valley is very fine, especially as seen on the descent to the bridge. On the other side of the bridge and close to the stream is an Olive mill, behind which is the road up the valley which brings you in a quarter of an hour to *The Chapel of San Giovanni*, distinguished by a large fresco of John the Baptist. The ascent to the chapel is rather steep, but, after passing it, becomes still more so. In a few minutes after leaving the chapel, a mule-path going up on the left, and then a rivulet are seen, and a little further on another, which you cross; the road then becomes very steep and winds up the edge of a rock, till near the summit of the ridge, a point reached in about a quarter of an hour. The path then turns off to the

right skirting the ridge but at a little distance below it. From this position a very fine view is obtained; on the right, of Capo Nero and Colla, with its churches boldly outlined on the horizon, and of the mountains forming the western half of the San Remo amphitheatre, as well as of the several spurs or ridges, each with its Sanctuary, which separate the valleys, while in front, the Sanctuary of the Madonna della Costa and the harbour of San Remo with its Fort and Molo come into view. The vegetation which skirts the pathway to the ridge, and which clothes the ridge itself, is totally different from that before met with lower down; we have now ascended above the region of the Olive trees, and cropping up between the fissures of the rocks are bushes of Myrtle covered with their small purple olive-like fruit; of Juniper, and Rosemary, both in blossom; of Pistacia Lentiscus, and also of the large pink Rock Cistus, C. albidus, which, however, is not yet in flower.

A good climber might here leave the pathway and ascend to the very summit of the ridge, when doubtless he would be rewarded for his exertions by a still nobler prospect; but it is now time to think of returning home. The distance to the Chapel of San Giovanni is not considerable or the ascent great, and the excursion thus far is one that could be undertaken by most persons; and does not occupy more than an hour from the Sanctuary. The remainder of the journey is, however, a trying one and should only be undertaken on foot by the strong or on a donkey; even then the road in some places is exceedingly rough. To return home, do not retrace your steps, but continue on the same path, which now makes for three or four minutes a steep descent over some layers of shale; you will then notice a pathway leading right and left; turn to the left and very soon the bed of a small stream is reached; follow this for a few yards, when you will notice a thin cascade of water flowing over a long slanting rock. The road now ascends, winding round to the right, and in a few minutes you come to a small shrine, where it divides into three; one ascends the hill, one branches off to the left and goes to San Pietro, the other turns to the right, and this is the one to be now followed. The descent by this road which runs for some distance along the spur which separates the San Francia from the Bestagna Valley is very steep, the vegetation nearly similar to that on the ridge above, but with the addition of many bushes of Broom, Spartium junceum L., and of the Prickly Broom, Calycotome spinosa Link. After continuing the descent for about half an hour, a path is seen running in the direction of the Bestagna Valley and by which the return to the town may be made, but it may also be made by continuing to follow the wide path: *this brings* you to a small one-arched bridge, near to which is a mill

now closed; having crossed this bridge the mule-path ascends and joins that by which we originally started, so that we reach home by the old town. This is a particularly pleasant and even beautiful excursion. In the visits which we have hitherto made to the valleys around San Remo the silence has only been broken either by the murmur of the streams flowing through them or by the reports of murderous guns, scarce a twitter from the birds themselves being heard; but on this occasion all was changed, the Olive woods resounded with the notes and songs of birds, the firing of guns was no longer heard, the sportsmen being deterred, it is to be hoped, by some municipal regulation prohibiting the destruction of birds at this season of the year.

The Olive Mills.— A shorter excursion is that to the Olive Mills. Ascend through the old town as before; on emerging from the Candelieri gateway, instead of following the road up to the Sanctuary, turn off by the first mule-path on the right which leads down the valley. In the course of a few minutes you arrive at the stream; this is here crossed, either by a combined aqueduct and foot-path, the latter leading to some mills at present disused, or by a picturesque little bridge. On the other side of this on the right, an old Fig tree is seen with its thick trunk so much inclined over the path, that it has been propped up, and on the left two Olive mills. The greater part of the Fig tree has now been cut down, and is now no longer an object of interest. The view of the aqueduct and bridge, of the stream, the valley and its surrounding Olive-clad hills and mountains is very pretty, and the scene altogether is one which artists are fond of sketching. Having crossed the bridge, the ascent becomes rather steep. In a few minutes the path reaches the new Strada Francia, already referred to, on the other side of which there are two paths: that to the left leads to San Pietro, and the one to the right skirts the edge of the valley for a short distance, and from here there is a very beautiful view; looking down into the valley many Almond and Fruit trees are seen, covered with their pink and white blossoms, and numerous fruit-laden Lemon trees, the colours of all these standing brightly out against the blue green and silver tinged Olive trees; on the other side of the valley the Madonna della Costa and a portion of the old town are seen in bold relief, while up the valley there is a fine view of the Olive-crowned hills and of the more distant Fir-clad mountains. A few yards from this, the path turns to the left past the Villas Bosio, and descending, terminates in a road recently made, the Via Francia, which runs beside the parish church of the Madonna degli Angeli, and which ends at the commencement of the Corso Garibaldi. This excursion occupies little more than an hour, and but for the ascent through the old town would be an easy one. For those who cannot go up

hill well, it would be better to enter the valley by the Church of the Angels, and to return by the old town.

The Chapel of San Michele.—Follow the San Romolo road, which runs on the top of the ridge separating the San Romolo and San Francia Valleys, for about forty minutes, by which time the chapel of San Giacomo on the left is reached. On the way a shrine with a broad blue border is passed; from this a path is given off on the left which descends into the San Romolo Valley. Immediately after passing the Chapel a small shrine is noticed on the left, and in five minutes more a path branches off on the right which descends into the Valley of San Francia. From this point the head of the valley comes well into view and the Chapel of San Michele is seen perched high up, the mountain behind it being clothed with Fir-trees. To reach this chapel, the San Romolo road must be left and the pathway down the valley above noticed followed; there is an excellent view from the Chapel of the Valley of San Francia, and Mr. Aspinall states that he found some good specimens of fossils of vegetables among the Fir-trees behind the Chapel. The ascent to San Michele is steep. The return is usually made by the San Romolo road, but it may be varied a little by descending into the Valley of San Romolo to the path already referred to as branching off at the shrine with the blue border; this may be reached by a somewhat narrow and steep path, from the San Romolo road, just after passing the Chapel of San Giacomo. This excursion is described by Aspinall under the head of the San Romolo or West Sanctuary Valley, but it really belongs to the San Francia Valley, at the head of which the Chapel is situated.

THE BESTAGNA VALLEY.

Church of San Pietro—Croce di Parà—Chapel of Villetta—The Bridge.

Leave the main road at the Church of the Angels, ascend the mule-path which passes by the Villas Bosio, and which skirts the eastern side of the San Francia Valley, it being in fact the same path by which the return was made from the Olive mills as described under the head of the San Francia Valley. Follow this path for about a quarter of an hour until it divides into two in front of a shrine, with an overhanging Rose tree; on the way the little path on the left is passed, leading down to the bridge which crosses the stream, but which is now interrupted by the new San Francia road; the path to the left of the shrine joins after a time that by which the return from the Chapel of San *Giovanni* was made, as already described. Take the path to the

right, which at the second shrine passed bears to the left, and now begins to skirt the Bestagna Valley; at this point the sea becomes visible through the branches of the Olive trees, and a good view is obtained of the valley, densely clothed with Olive trees, and of the houses scattered over the lofty hills which form the eastern boundary of the valley. In about twenty minutes the valley narrows considerably, and seems in fact almost to terminate, the stream being crossed here by a small bridge; do not go over this, however, but continue to ascend by the path which you have hitherto followed; this for a short distance is very steep, two little bridges are crossed, and two cascades flowing over long slanting rocks are passed; immediately afterwards the very pretty and well preserved little *Church of San Pietro* is reached, commanding a good view of the Bestagna Valley. The return home may be made either by the Church of San Giovanni, or by the Croce di Parà and Villetta. If the former be chosen, ascend a short distance the same mule-path by which you arrived; bear a little to the left, ascending about 200 feet; bear again to the left till some cottages are reached, then turn still more to the left down the hill, when you will reach the road from San Giovanni by which the return to San Remo must be made.

If the way by the Croce di Parà be chosen, continue up the pathway to the right for a few minutes, when it divides; follow the left-hand division; the ascent is very steep and rough and must be continued for a quarter of an hour or twenty minutes, when the ridge of the hill is reached and the wooden cross, *The Croce di Parà*, comes into view. From this site there is a really very magnificent prospect; in front lies the broad Martino Valley, with, on the further side, the Church of Sant' Antonio and the scattered houses of Verezzo; on the nearer side the handsome Church of San Donato with its fine tower: to the left is Monte Bignone, while behind is the Valley of Bestagna, with, in the distance, the Madonna della Costa and the sea. From the Croce three roads branch off; one to the left runs along Il Poggietto, a crest which leads up to the summit of Bignone; a second, also somewhat to the left, goes down the Martino Valley to Verezzo, by which San Remo may be reached; and a third, which turns to the right and, skirting the western side of a small hill, runs along the ridge which divides the Bestagna and Martino Valleys. Ascending now to the tower built on the ridge of Il Poggietto and at an elevation considerably above the Croce di Parà, a still more extensive and glorious view is disclosed. On the right, Capo Nero, the churches of Collo, the Madonna della Costa, San Remo and its port and the Bestagna and San Francia Valleys are all spread out beneath; while on the left are the Martino, Ceriana, and Taggia Valleys with Bussana, Poggio, Capo Verde crowned with the Madonna

della Guardia, and lastly Pompeiana. Thus from this point the whole of the mountains, forming the San Remo amphitheatre, including Bignone, with most of its enclosed valleys and towns, are all clearly visible. The view here is altogether different from that obtained at lower elevations; the Croce di Parà is just above the region of the Olive trees, and the summits of many of the surrounding hills and mountains are almost bare, although some of the peaks are clothed with forests of Fir-trees.

Seen from this point some of the higher hills present a striated appearance, their component strata being vertically disposed; others, though apparently denuded of vegetation, are really more or less covered with brushwood formed of Juniper, Pistacia, Rosemary, Prickly Broom, and a variety of mountain plants especially interesting to the botanist. Altogether the view from Il Poggietto is one of the finest I have yet beheld.

The day was splendid, and at two o'clock on the afternoon of the 10th of March the sun was shining strongly and the air was as warm as a Midsummer's day in England. The new year's butterflies, chiefly white ones, with occasionally a Painted Lady, which no doubt had survived the winter, were everywhere to be seen in great numbers, as well as many Humming Bird Moths. While admiring the view from the Croce, two bird-killers passed me making their way to the pine-forests of Monte Bignone, and shortly afterwards the reports of their guns were heard, showing that up to this date the poor birds had not been granted the protection of a close season. These pine forests are said to contain thrushes in large numbers.

The return home was made by the path to the right leading round the west side of the hill and traversing the ridge dividing the Bestagna and Martino Valleys.

From this ridge also extensive views are obtained; on one side of the Valley of Bestagna and San Remo, on the other of that of San Martino with the towns of Bussana and Poggio, with in front the blue Mediterranean dotted with white butterfly-like sails. The descent is very steep and rough and occupies about an hour; although the road winds about somewhat there is no possibility of mistaking the way. The small Chapel of Villetta is passed a few minutes before the mule-path joins the Genoa road, which it does to the west of the Hôtel Méditerranée and nearly opposite the Villa Rossi.

The Bridge—Leave the main road by the west entrance of the Strada Peirogallo, a carriage way, formerly the Via Piccone, which commences at the Rondo just beyond the Hôtel d'Angleterre. The road runs close to the torrent for some distance, having houses on either side of it; it ascends the valley gently, and in about twenty *minutes* you arrive at a small, single-arched bridge, whereby the

torrent is crossed. The ascent on the other side is somewhat steep; there are several good and well placed villas near the termination of the road; on the left the Villa Rococo, Villas Maddelena and Angelina, and on the right the Villas Zirio. The road at the Villa Brigida turns sharply to the right and ends at the Genoa road nearly opposite the Mediterranean Hotel. Before crossing the bridge a small path ascends beside the stream on the left, which may be followed for a short distance. This road forms an easy and sheltered walk, suitable for an invalid. The valley is still very pretty, but it is much changed since the formation of the road. The large and ancient Olive tree at the commencement has disappeared, as well as some of the wild flowers; the valley still presents, however, especially at its upper part, a green and fresh appearance, owing to the terraces being everywhere covered with the young blades of the wild or self-sown Oat, which springs up each successive year and is met with not only in the Bestagna, but more or less abundantly in all the other valleys, clothing them with verdure and making them appear at a little distance as though they were carpeted with grass.

THE MARTINO VALLEY.

The Chocolate Mill—The Corn Mills—Verezzo.

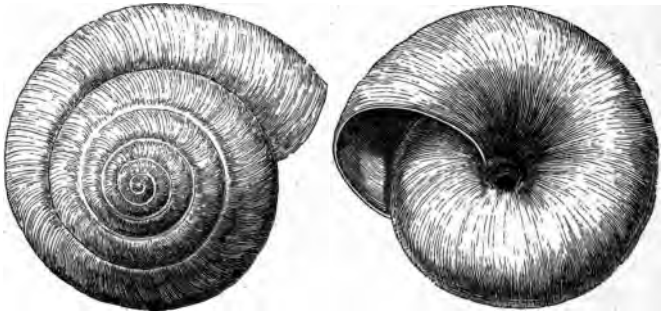
This is one of the most accessible, sheltered, and frequented of the valleys on the east side of the town. Leave the high road by the Strada Peirogallo, a carriage road to the west of Villa Olivemount; a little way up close to the Villa Brigida the road branches into three; the left branch is the continuation of the Strado Peirogallo and skirts the Bestagna Valley; the middle one is a mule-path and leads to the little Chapel of Villetta; the third to the right is the new carriage road to Verezzo, and this is the one to be followed. In a few minutes a mule-path leaves this on the left and marked by a stone having a swallow painted on it. Either this path may be followed or the carriage road, the path terminating in this at some distance on. A few yards further the continuation of the path is seen on the right leading to the Chocolate Mill. Keep on the carriage road for a little distance, and then take the mule-path on the left, which in parts is very steep and gradually ascends to a considerable height, running along the eastern side of the spur which separates the Martino and Bestagna Valleys, and after about an hour's climbing it emerges above the region of the Olive trees and near the eastern side of the hill, the western side of which was traversed on the return journey from the Croce di Parà. On the whole of this route, to near the summit of the hill, wild flowers abound, the

Narcissus, Tulip, Grape and Oriental Hyacinths, with here and there a patch of Gladiolus not yet in flower, the terraces being everywhere made verdant with the wild Oat.

Turning round and facing the south, before quitting the Olive trees, and at a little distance from the summit of the hill, a good view is obtained of the sea, and on the left of Capo Verde with the Madonna della Guardia and the square tower of Poggio, while on the right, through the trees, there is a glimpse of the Church of San Pietro.

Ascending now still higher up the hill, we are once more in the region of Rosemary, Myrtle, Juniper, and Broom, and from this position a still more extensive prospect opens out to view; looking across the Valley of San Martino the Church of San Antonio is seen, but not Verezzo, or the Church of San Donato;

FIG. 30.



while, behind, the Church of San Pietro, standing near the head of the valley, also forms a conspicuous object. Should a still longer excursion be desired—but the one already described is both too long and too steep for invalids, unless they are mounted, and even then it is attended with considerable fatigue—the hill may be skirted either on the east or west side and the Croce di Parà reached, when, turning down to the right, the return home may be effected by Verezzo, or to the left by San Pietro or even San Giovanni: in most cases, however, it is best to return by the same path, which is steep and narrow until the broader mule-path is reached. On the way I picked up some very fine land shells of the genus Zonites, Z. algirus L., two of which are shown of the natural size in the annexed wood engraving (Fig. 30). There is no land shell in England which can be compared with this in size. Colonel Cox has given me a very instructive vertical *section of this* shell, while Miss Chance has met with some much

larger specimens than those shown in the figure. In the winter this species buries itself in the earth.

The Chocolate Mill.—Turn from the main road at the Strada Peirogallo on the west of Villa Olive Mount; continue along this till you come to Villa Brigida, where you enter on the new carriage road to Verezzo; this at first passes at the back of Villa Ormond, a little way beyond which on the left a stone is seen, with a swallow painted on it. On the left of this stone is a mule-path, which if taken will be found to join the Verezzo road some distance on. A few yards further on this road, the continuation of the mule-path will be seen on the right-hand side. Follow this; it descends into the valley; very soon two reservoirs and a Palm tree are reached, and a little further on is a notice board, with an arrow pointing in the direction of the Chocolate Mill, where you arrive in about ten minutes. This is a very pretty, as well as favourite excursion. The manufacture of Chocolate, very interesting to witness, is still carried on at the mill by Mr. Capoduro, who is very polite and attentive to all visitors. There is here an old arch from which the water trickles, and under which the Maiden Hair and other Ferns grow. The stream may here be crossed by an aqueduct; the view from the other side is very pretty and picturesque, and one which an artist would delight in. First there is the little murmuring and somewhat pent-up stream making its way over the rocky boulders which form its bed; then the aqueduct with its several arches, and lastly the mill tinted a pink colour, with its large wheel over which the water is rushing.

The mill with its pink walls and green shutters stands out in strong contrast against the dark green of the Olive trees, the sombre hue of which is still further relieved by the yellow colour of the fruit-laden Lemon trees, the bright pink blossoms of the Almond and the pure white flowers of the Cherry trees. From this point a steep ascent occupying about a quarter of an hour may be made, but this should not be attempted by an invalid. The narrow rough steps by which the ascent is accomplished are exactly opposite the wheel of the mill; at the top of the steps a path runs right and left, and from both of these, but especially from that on the left, good views may be obtained. Following the left-hand path the valley is seen to great advantage, with in the distance the Church of San Donato, while above the valley rises Bignone steep and massive.

From this point, keeping on the right or eastern side, the ascent of the valley may be made to Verezzo and so round to the Croce di Parà and home by Villetta or by San Pietro or San Giovanni, but these are very long excursions. In most cases it is best to recross the stream and return by the Chocolate Mill;

the excursion is then a very pleasant one and quite within the compass of most invalids. After crossing the stream wild flowers again become abundant, especially the scented Violet and yellow Narcissus.

The Corn Mills.—A few minutes after passing the Victoria Hotel, take the mule-path to the left; it is on the town side of the bridge over the Martino Valley with a small building at the eastern corner; follow this for a short distance, when an old mill will be reached, close to which is another mill with a water wheel, and near this an iron gate, through which the path passes and which in about ten minutes ends at the stream. The valley here is very pretty, being full of Lemon, Almond, and other fruit trees, and the terraces are clothed with wild flowers. The return must either be made the same way or by mounting to the mule-path which leads from the Chocolate Mills. This is a very easy and suitable walk for an invalid, especially if the ascent to the upper mule-path be avoided; when, however, that is reached and a somewhat longer excursion is desired, the walk may be continued on to the Chocolate Mills.

Verezzo.—The most direct way to Verezzo is by the new and picturesque road already referred to as in course of construction and which runs along the ridge separating the Bestagna and Martino Valleys, skirts the latter high up, and is already completed as far as the Chocolate Mills. But the following was the path usually taken before this road was contemplated. Cross the bridge on the Genoa road beyond the Hôtel Victoria and take the mule-path immediately to the east of the small house, Villino Bensa. The path is steep and rough, but after ascending for a few minutes there is a beautiful view; on the left, of the town, with its port, the Madonna della Costa, Capo Nero, the churches of Colla and the higher mountains beyond and on the right, of Capo Verde and the Madonna della Guardia. The path now becomes less rough and there is a good view up the valley of San Martino, the churches of San Antonio and San Donato being seen in the distance, while on the right is the Vallée des Oliviers with the Ceriana road on its further side; in a few minutes a branch path is given off which leads down into this valley; do not take this however, but continue the ascent of the San Martino Valley; in about thirty-five minutes after leaving the high road a shrine is reached and another path given off which also leads down into the Vallée des Oliviers; pass this, and keep straight on; the view of the Valley of San Martino as we proceed becomes still more interesting, the Chapel of San Pietro appearing on the crest of the ridge on the other side of the valley, and the handsome Church of San Donato now standing out in bold relief. Ascending a few steps, on the right a good view of the Vallée des Oliviers is

obtained and, across it, of Bussana, apparently perched on the edge of a steep cliff. Continue on the mule-path which leads to Verezzo for a considerable distance further; although gradually ascending and increasingly rough and rocky, it cannot be missed or mistaken for any of the lesser paths which branch off from it. At length a hill is reached, above the region of the Olive trees, distinguished by a solitary Fir tree growing on one side near the top. The path to Verezzo skirts the western side of this hill, but before rounding it a smaller path is given off on the right leading down the Vallée des Oliviers, which here apparently terminates, the windings of the Ceriana road being seen across the valley, and Bussana once more forming a conspicuous object in the landscape. Skirt now the western side of the hill, from which a truly grand view is obtained, embracing the Church of San Donato, the Croce di Parà, the tower on the ridge of Il Poggietto and Bignone with other mountain peaks. From this point the distance to Verezzo is not very great, and the return home may be made by the Croce di Parà and by Villetta, or by San Pietro, or San Giovanni, all long excursions; but a shorter way and one not yet described is by the Vallée des Oliviers.

THE 'VALLÉE DES OLIVIERS.'

Return to the path already referred to under 'Verezzo,' as leading down from the head of the Vallée des Oliviers, descend by it; it is very steep and rough, but is particularly interesting in consequence of the number, size, and beauty of the Myrtle, Juniper, Rosemary, and other shrubs which help to cover and give verdure to the rocks. In a few minutes the Olive groves are once more entered, and the small clear stream reached. While in one or two spots in the Valley of San Martino the air was scented with Wild Thyme, not yet in blossom, here it was perfumed with the odour of Violets, growing in such profusion as literally to carpet the ground. On some of the moistened rocks beside the stream, Maiden Hair fern was found in large quantities, the fronds being finer than any I had seen before. Cross now the stream to a pathway which leads along the eastern side of the valley; in a little time a shrine is reached where a branch path is given off leading to the left; this doubtless joins the Ceriana carriage-road which skirts the valley at a higher level; do not take this, but continue up the valley for some distance, when suddenly the path descends towards the stream, which must be crossed again, and in a few minutes more it joins the mule-path already referred to, by which the journey to Verezzo was commenced. Once more San Remo is seen from a

most advantageous point of view, Capo Nero and the higher mountains beyond being, as they were then seen, all bathed in the light of a glorious sunset.

Presuming the excursion up the Vallée des Oliviers to be commenced from the foot in place of the head of the valley, the same way would have to be followed, but in reverse order; in this case the excursion might be varied by taking the path given off at the shrine, now of course on the right-hand side and which leads to the Ceriana road and so home, if a short excursion only be desired; but if a longer, it might be extended by going to Poggio and from thence to Ceriana, or from Poggio across the Valley to Bussana or to the Madonna della Guardia.

CAPO VERDE AND THE CHAPEL OF THE MADONNA DELLA GUARDIA.

The excursion to the chapel of the Madonna della Guardia situated on the summit of Capo Verde is a particularly pleasant and practicable one : it can be accomplished by most persons of fair walking powers, but invalids should ride there. It may be approached by two carriage roads—one is that to Poggio, and the other crosses the railway from the Genoa road and runs along the seashore, gradually ascending until the Chapel of the Madonna della Guardia is reached. From time to time, on the way, look back, when a view of San Remo and its surrounding mountains is obtained, a view gradually increasing in extent and beauty until the Cape is nearly reached, where the prospect is really fine. From this point several of the spurs projecting from Monte Bignone, with the intervening valleys terminating in blind extremities on the side of the mountain, are clearly seen, surrounded by a number of tall Cypress trees like sentinels on guard, and here indeed a most extensive and lovely prospect of both sea and land is spread out to view. Following the coast line on the west, San Remo is seen lying far below, skirted by the ever beautiful Mediterranean, with its white crested waves breaking gently on the shore ; beyond this, Capo Nero and Colla with its churches ; still further on, the promontory of Bordighera, part of Mentone and, it is stated, on clear days even the Esterel mountains.

Along the coast eastward lie the villages of Arma, Riva, and San Stefano, and far away on the sides of the hills are Pompeiana and Castellaro, while behind the Chapel and on the right side of the valley of Ceriana is Bussana, curiously crowded on the summit of a small hill, and on the left side, Poggio, both of these towns standing out with marvellous distinctness in the clear Italian *atmosphere*, and forming beautiful objects in the landscape.

Still more to the north, not only are the mountains which form the amphitheatre of San Remo spread out before the beholder, but far beyond them, extending eastward, the higher Alps, some capped with snow, the whole forming a panorama of exceeding beauty and even grandeur. Having feasted our eyes with the prospect, having noticed the extent of the Olive groves, and the dense forests of Fir trees stretching even to the summits of some of the mountains, in place of retracing our steps, it is better to cross the ridge to Monte Calvo and to return home by Poggia and the Ceriana road.

THE VALLEY OF CERIANA.

Poggio—Bussana—Ceriana.

The Valley of Ceriana lies to the east of the Madonna della Guardia, between it and the Valley of Taggia ; it does not, therefore, form one of the valleys of the San Remo amphitheatre, but it is so close to it and to the Vallée des Oliviers that no description of the excursions in the neighbourhood would be complete if it did not include the Ceriana Valley. A very good view of this valley is obtained from the Genoa road, and looking up it from that point the towns of Bussana and Poggio are seen, occupying conspicuous positions, and either may be reached by pathways leading up the sides of the valley. That to Bussana leaves the main road near the bridge of Arma and skirts the eastern side of the valley; it either has been or is about to be converted into a carriage road, which will make Bussana very accessible. Usually, however, the excursion to Poggio is made by the Ceriana carriage road and that to Bussana by crossing the valley from Poggio. Bussana may also be reached by crossing the valley from the Madonna della Guardia; this, however, would be rough walking.

Poggio.—One of the principal drives in the neighbourhood of San Remo is that to Poggio and thence to Ceriana. The road to Poggio turns off the Genoa road on the left about a quarter of an hour's walk from the Hôtel Victoria at the Villa della Madonna ; from this point it gradually ascends all the way until Poggio is reached, the distance being accomplished in about an hour and a half at an easy walking pace.

The road skirts for a short distance the Vallée des Oliviers, through which flows a stream, the murmur of it pleasantly reaching the ears ; suddenly the valley becomes very narrow, the road crosses it by a bridge and, turning abruptly to the right, continues for some little distance along the opposite or eastern

side of the valley. About five minutes after crossing the bridge, a pathway will be seen on the left, and a few yards further on a second pathway; this describes four short, sharp zigzags, and leads up to the small Chapel of San Rocco, from which the pedestrian may reach Poggio by a shorter and steeper way. Pass the chapel to where four paths branch off near a cottage, the one to the right brings you to Poggio on the left of the square tower. While on the ridge you have on the left the Vallée des Oliviers, beyond, the Martino Valley, some of the houses of Verezzo and the tower of San Donato, while on the right hand is Monte Calvo and the Madonna della Guardia. On the west the Chapel of Villetta is seen.

Should the traveller prefer the route to Poggio by the high road he must of course not take the pathway which leads up to the Chapel of San Rocco, but must follow the road for a short distance, when it turns to the left and runs in a westerly direction. From this part of the road the sea is plainly visible with its waves continually rolling in and breaking on the shore in white foam, with a sharp and refreshing sound.

After a little while a small stone quarry is passed and immediately afterwards the end of a small valley is crossed by a bridge with several arches; after this the road makes several abrupt turns, gradually ascending until Poggio is reached. The hill sides on this route are thickly clothed with fine Olive trees, a few Lemon trees being also occasionally seen low down. On the way I came across a group of small Fir trees; on one of these I noticed the little nest of the Processional caterpillar, the first I had seen in the neighbourhood of San Remo, and the history of which has been given in a previous chapter. As an evidence of the mildness of the climate, I may mention that in one spot I noticed several Rosemary bushes in full blossom on the 4th of January, 1879, and around these some butterflies were on the wing. Another evidence of mildness was afforded by beds of broad beans about two feet in height and of peas in an equally forward state.

On turning round just before entering Poggio, a glorious view meets the sight; on the right a ruined chapel and the square tower of Poggio are seen, while low down San Remo with its bay lies spread out at our feet, and above are Capo Nero, Colla, and the mountains forming a portion of the San Remo amphitheatre. From the chapel itself the views are very fine; one is across the broad and open Valley of Ceriana to Bussana, which stands boldly and picturesquely on a plateau near the edge of the curiously scarped rocks which here form the eastern side of the valley. Casting the eye around, the peaks of nearly all the higher mountains which form the protecting amphitheatre of San Remo are

seen, and looking up the Valley of Ceriana a snow-clad mountain with its pointed summit comes into view.

Near the ruined chapel are two pathways and a narrow carriage road, one path encircling the sea from Monte Calvo, which is here seen to be almost entirely of schistous formation and the bare western side of which is scored with deep furrows occasioned by several small streams running down the face of the mountain at the period of great rainfall: the other, which is broad, paved, and in places provided with steps, winds round the back of the mountain; following this for two or three hundred yards a large iron cross is reached from which the path descends to the Madonna della Guardia, of which a good view is obtained from this point as well as of San Stefano on the shore line to the east: the distance to the Madonna is but short, and it is better to return home by it than to retrace your steps; this you can do either on foot or in a carriage, and the views from the Chapel are even finer than those from Poggio. Another excursion which may be made from this point is across the valley to Bussana, but this involves a sharp descent and a steep ascent. The villages of Poggio and Bussana stand like protecting fortresses on either side of the valley guarding its entrance.

Poggio itself is entered by a short street, in which the usual slender arches are replaced by some so deep and high as to contain within each a separate room with a window on either side looking up and down the street; this is the most noticeable architectural feature of the town, but we observe here, as in most other places on this coast, narrow steep streets with frequent stone steps, numerous archways and the steepest possible flights of stairs leading up to the rooms occupied by the inhabitants.

Ceriana.—After passing through the town of Poggio the view of the surrounding mountains and up the Valley of Ceriana becomes very beautiful, and the murmur of a not inconsiderable stream reaches the ear.

In a short time the road touches the Vallée des Oliviers, and at a shrine on the left a pathway is seen going down into that valley; and very soon afterwards another on the right leads into the Valley of Ceriana. The road now quits the Ceriana Valley and skirts the Vallée des Oliviers for a long distance, the view into and across which is very beautiful. In a little while the road again approaches the Ceriana Valley, which now becomes narrower and, on looking down it, the windings of the stream along its whole course until it reaches the sea are plainly visible. The road then runs along the western side of the Ceriana Valley for some miles, gradually ascending all the way until it reaches a great elevation, the prospect expanding and becoming increasingly lovely; the sides of the valley are thickly clothed with Olive trees

and the summits of the hills and mountains more or less covered with Firs. Scarcely a house is to be seen along the whole of this valley. We are now approaching the town of Ceriana, a small waterfall is passed, from near which a still more extensive view of the course of the stream is obtained, with Bussana and Poggio on either side of the valley; the road shortly alterwards begins to descend and, after a few further windings, *Ceriana* suddenly stands before us on the side of a protecting hill, a spur of Bignone one of the ascents of which is made from this place. The town looks well from a distance, but an inspection is somewhat disappointing as it presents but few architectural features of interest or beauty. The church is of great antiquity. As the road along the valley rises above the region of the Olive trees the vegetation becomes more varied and interesting; the Myrtle is met with in large quantity, Pistacia Lentiscus, Coriaria myrtifolia, Rhamnus alaternus, and several other shrubs and evergreens, including the Mediterranean Heath, in the full beauty of its blossom, and perfuming the whole air with its sweet and delicate odour.

Near to Ceriana the vine is extensively cultivated, frequently on terraces, and a little way from the town itself there are great numbers of fine Spanish Chestnut trees, San Remo being largely supplied from them with this, amongst the Italians, favourite and staple article of food. Among the wild flowers on the way to Poggio, the snow-white Star of Bethelehem, Ornithogalum divergens L. with its flowers fully expanded under the influence of the warm sunshine, and Adonis autumnalis, with its pretty little cherry-coloured blossoms, were frequently noticed. Butterflies were seen along the whole route on the 11th of April in countless numbers; the chief kinds were the Clouded Yellow, Colias edusa; the beautiful Sulphur coloured Rhodocera rhamni, and the Swallow Tail, Papilio Podalirius; but the number met with of these kinds was few compared with the Painted Lady, Pyrameis cardui, of which there must have been many hundreds, flitting about in all directions, particularly on the blossoms of the Wild Thyme. This is one of the most active and hardy of Butterflies, the first on the wing in the morning and the last to go to rest in the evening, being found especially where the rays of the setting sun linger longest. It is not an uncommon circumstance to see these Butterflies flying about in the rain in search of food, the more necessary to them in consequence of the great activity of their habits. It is the only species I know which braves the rain, and in doing so it incurs no little danger, for when a heavy and sudden shower comes on, they are overwhelmed and perish in large numbers. Another of its peculiarities is the disposition it exhibits to settle on roads, pathways, and walls. When leaving *the town of* Ceriana as the afternoon set in, I noticed that all

the Butterflies of this species flew in one direction, namely down the valley; not one was to be seen going up it; the reason for this was, I imagine, to seek a warmer temperature to rest for the night. The time to see Butterflies in the greatest numbers and to the best advantage is early in the morning, when they are busy feeding; one then finds out the flowers they like best, and as they are far less wild and restless, they are seen in all their beauty: later in the day they become much wilder and seem in fact to be simply enjoying the freedom of their sunny lives, taking long flights without settling.

If the traveller be on foot, the return home from Ceriana may be made along the opposite side of the valley, or, retracing his steps by the Ceriana road as far as the shrine and the pathway already noticed near to Poggio, he may follow this path and it will bring him first across the Vallée des Oliviers, and then along the ridge which separates that valley from the Martino Valley, the Genoa road being gained at the Villino Bensa. Care must be taken not to miss the right path; there is one on the left which runs for some distance but leads only to some cottages. This excursion is a very long one, and whether made on foot or by carriage occupies the greater part of the day: it is one of the finest, however, in the neighbourhood, and should certainly be taken. The best time for it is about the end of April or beginning of May, when the Vines and Chestnut trees near the town are in full leaf.

THE VALLEY OF TAGGIA.

Taggia—Castellaro—Madonna di Lampeduza.

Seeing some very fine Oranges and Lemons in the market at San Remo, I inquired where they came from, and was told Taggia; this at once gave me the desire to see that place, and I determined to time my visit before all the oranges had been gathered. The excursion to Taggia is one which should on no account be omitted, not only from the ease with which the valley and town may be reached, but from the interest and beauty attached thereto. Taggia is about six miles from San Remo and is on the western bank of a broad valley of the same name running, as do nearly all the valleys in this part, north and south. You may drive, or go by railway, the station for Taggia, just beyond the little village of Arma, being reached in a few minutes from San Remo.

The walk from the station up the valley by the broad carriage road is particularly pleasant, running as it does through forests of very fine Olive trees, planted with considerable regularity on a level, instead of in terraces as is usually the case, the ground

beneath them being thickly covered with grass, the whole presenting a stately and park-like appearance. After about three-quarters of an hour's walk the Chapel of the Campo Santo is noticed, and a little further, on an elevation, stands the large Church of the Dominicans. Looking into the valley as we approach Taggia we obtain first glimpses, and afterwards the full and glorious sight of groves of Orange trees of great size and beauty literally laden with golden fruit half concealed in the rich dark green foliage. Indeed in this part of the valley Orange trees equalling in size the largest Apple or Pear trees meet the eye everywhere, each bearing hundreds of oranges and growing too in the open valley without any special protection; to such an extent do they abound here that it might be well termed the Valley of Orange trees. Not only are Orange trees seen here, but innumerable very fine Lemon trees, bearing abundant crops of large-sized lemons; then the Vine is largely cultivated, it being so trained as to form long covered walks, the fruit hanging temptingly from the trellis work overhead. To complete the picture of this fruitful valley we must not forget to notice the dense groves of Olive trees which clothe its sides, with lofty Cypress trees rising above them here and there; while in and near the broad stream which runs through the valley are large beds of Bamboos or canes attaining a height of some 15 or 20 feet, as also numerous trees of the Golden Willow, now bare of leaves, but the bright yellow coloured stems of which yet impart character and warmth to the scene.

The approach to Taggia is very pretty. On the eastern side of the valley before descending into the town, the village of Castellaro with its churches is seen high up, occupying a commanding situation; the hill side being clothed with Olive trees to the base of the town. At a little distance from it, but more to the north and at a still greater elevation, stands the Chapel of the Madonna di Lampeduza, from which there are very extensive views.

Entering now the town of *Taggia* one is much struck with its quaint appearance, it being even more curious than San Remo, though there is much in common between the two; the number of arches thrown at intervals across the streets is even greater than in San Remo; in one short street I counted as many as eleven, proving that the fear of earthquakes at the time Taggia was built was as strong there as at many other towns of the Riviera. Some of the streets are even more remarkable than any met with in the old town of San Remo, as the Via Soleri, on either side of which runs a broad and rather handsome arched and pillared corridor under which are some of the principal shops. At the corner of this street is the house formerly occupied by the mother of Ruffini; here he spent some of his earlier years, resided from time to time, and ultimately died.

The practice extensively prevails at Taggia of hanging branches of trees over the doorways; in general this is confined to wine shops, and branches of the Fir tree are selected, but here shops of other descriptions are also thus distinguished, the branches being those of the Olive or Bay tree.

Taggia contains several handsome churches, which are evidently more cared for than are many of those in the neighbouring towns. It is to be regretted that I could not meet with any photographs of the many architectural curiosities of Taggia. I must not forget to refer to the Palace, which formerly belonged to the Marquis Spinola; this must at one time have been a very fine building; it is now, however, in a state of dilapidation and ruin, the habitable portion being used as an inn, the Albergo d'Italia. This once beautiful palace affords another of the many striking illustrations of departed greatness met with in nearly every town in Italy.

Leaving Taggia by the bridge we crossed the Argentina stream which here is really considerable, its bright blue water flowing down the valley with great rapidity and imparting to it the fertile and fruitful character for which this valley is remarkable. The bed of this stream is of great width, and over it are strewn large masses of waterworn rock; these have been brought down from the surrounding mountains during periods of flood; in this way, in the course of centuries, the bed of the river has been undergoing a gradual process of elevation, and the sea, which it is affirmed formerly flowed up the valley as far as Taggia, has been forced back. Francis the First after the battle of Pavia in 1525 is said to have embarked from Taggia for Spain.

The bridge which crosses the valley at Taggia is a very long and curious one; it consists of many arches of strangely unequal sizes, and what is more singular is, that the bridge does not run straight across the stream, but makes a considerable bend; this may have been given to it to secure a more convenient landing place on the other side or to afford the buttresses greater power to resist the force of the water at the period of floods. Near either extremity of the bridge are shrines; that close to the town is in marble and represents the Holy Mother and Child with two attendant apostles holding clasped missals. The other is a painted picture so much worn by time that the subject can scarcely be distinguished. I could make out a ship in flames and a small boat in the foreground. It was while sitting on this bridge that Ruffini, gazing on this pleasant and peaceful valley and inspired by the beauty of the surrounding scenery, first conceived the idea of 'Doctor Antonio,' the most famous and touching of all his works.

It is from the eastern side of the bridge that the excursion to

Castellaro and thence to the *Madonna di Lampeduza* is made. There is no regular road to either, but only a mule-path, and they seem so pleasantly perched upon the mountain side that it is hard to resist the temptation of paying them a visit at once. From both places there are splendid views; that from the Madonna cannot be better described than by Ruffini in 'Doctor Antonio.'

Along the eastern or right side of the valley, there is a road which extends even to Turin, and a very beautiful excursion may be made by it as far as *Badalucco*, an architecturally interesting town, so named, it may be presumed, from the resemblance of the scenery to that around the Baths of Lucca, and from it to *Montalto*, with its streets cut in the rock. But these excursions are both long. It is stated there will soon be a carriage road to *Badalucco*. There is also a path to the right of the bridge; on one side of this path are a number of curious bath-like tanks intended to store water for irrigation, on the other is a low stone wall through which water trickles and where Maiden Hair and other ferns are found growing in abundance. I did not, however, pursue this path any further, as the warm and sunny day, the 24th of December, devoted to the visit to Taggia was now drawing to a close and it was necessary to commence the return journey, which we did with great reluctance, for the day had passed very pleasantly in this smiling valley. Once more crossing the bridge we returned to the station by the same road; on the way we heard the repeated reports of guns in the Olive groves just at the time when the poor little birds were seeking their usual roosting haunts; waiting at the station for the train, no less than six of these 'chasseurs' entered it on their way to San Remo. It was pleasant, however, to turn from these slayers of feathered songsters, tomtits, robins, &c., to a gentleman bearing in his hands a small tree cut off near the roots and laden with ripe oranges; this was intended to be converted into a Christmas tree, and a very handsome and effective one it would make.

There are still a great many other beautiful places and excursions between Taggia and Genoa, all readily accessible, which might here be noticed; but to describe them would be to depart from the purpose of this work. The chief are: Porto Maurizio, with its commanding position and very handsome church; Oneglia, renowned for its olive oil and its macaroni manufactories; Alassio, with its abundant Orange trees and its Roman road; Albenga, celebrated for its cathedral, and as having been the head-quarters of Napoleon in 1796; the picturesque Finalmarina, and the still more charming Noli; the healthy Monte Grosso; the lovely Arenzana, and the quiet Pegli, with its celebrated Pallavicini Gardens and its temples and grottoes. *These and* many other places will be found described in the

author's work, entitled 'San Remo and the Western Riviera,' of which Messrs. Longman are the London and Signor Gandolfo the San Remo publishers.

I will now proceed to describe the Excursions on the western side of San Remo.

THE SAN ROMOLO VALLEY.

The West side of Valley—Across the Bridge—The Madonna del Borgo—The East side of the Valley—San Romolo—Piano del Rè—Monte Bignone.

The greater part of the old town, as already mentioned, is built upon the extremity of the ridge or spur which separates the San Francia Valley from the San Romolo Valley, this ridge forming the principal route to San Romolo. A small portion of the town, however, is on the western side of the San Romolo Valley, and hence by some writers San Remo is described as being built upon two hills. A stranger on first arriving here would experience no little difficulty in discovering the termination of this valley and the final course of the stream which runs through it: this arises from two circumstances; first, because the end of the valley is concealed from view by the houses of a portion of the old town, and second, since the stream itself at the same spot has been arched over and built upon.

The San Romolo Valley cannot be entered on the level, and in order to reach it it is necessary to climb up a considerable height, and in fact to incur an amount of fatigue far beyond the powers of most invalids; this is the more to be regretted, since the valley is one of the largest and prettiest of those included in the amphitheatre of San Remo.

The difficulty has, however, lately been considerably lessened by the construction of the Strada Berigo, more than once referred to. This commences at the Public Garden, and, after traversing for a very short distance the west side of the San Romolo valley, turns sharply round to the left till it reaches a circular space called the Rondo. From this point the road runs high above the town and most of the Villas in a westerly direction, for a considerable distance; it now makes a turn to the left, follows the eastern bank of the Foce Valley, and terminates at the Genoa road, close beside the bridge, which there crosses the Foce torrent.

The West side of Valley.—Enter the Strada Berigo by the Public Garden and follow it until the Rondo is reached, or enter the old town nearly opposite the Villas Carli and take the first turning on the left up the Via Costiguoli; after a steep ascent this brings you to the open space, the Rondo, just above the

Public Garden. A few yards to the west a small shrine with a figure in marble will be seen; this marks the commencement of the paved mule-path which leads to San Bartolomeo, distant about a mile and a half: a few yards further on, a path leaves the Berigo road and passes behind a small castellated house, Villa Torazzi, follow it on for twenty minutes, when a small dilapidated shrine will be noticed on the right. Before reaching this several small pathways are seen apparently leading into the valley; it is of but little use to follow any of these, as they only penetrate for a very short distance. One or two pathways will also be observed on the left leading towards the Foce Valley and just before the shrine is reached; another mule-path diverges from the San Bartolomeo path which apparently leads to the same valley; but more of this hereafter. From this shrine a very good view of the sea and coast line as far as the Madonna della Guardia is obtained. Leave now the mule-path and take the small path on the right which leads down into the San Romolo Valley; this descends in a winding manner for a considerable distance, and from it there is a fine view of the valley and of Monte Bignone. As the bottom of the valley is approached, the sound of the rushing water of the stream greets the ear, the stream itself being very soon reached; the path is here apparently lost, but following the stream downward for a few yards it is again met with, its continuation being visible on the other side, to which you can easily cross by stepping from rock to rock. On the other side, there is a good mule-path both up and down the stream; following that which leads towards the town, flourishing groves of Lemon trees are passed through, their bright green leaves standing out in vivid contrast with the soft, blue-grey foliage of the Olive trees clothing the opposite side of the valley; the pathway here is remarkable for the number of well-preserved shrines along its course; it runs below the building that was formerly the Hospital for Lepers, and enters the old town by the San Giuseppe gateway. This is a very pretty excursion, the Lemon trees so abounding in some parts of the valley that it might be appropriately called the Lemon Valley.

Across the Bridge.—Leave the town by the San Giuseppe gateway and turn immediately down the path on the left, which descends towards the river; in a few minutes this is reached and the pathway divides, one path running up and one down the river; that to the left leads to an olive mill, from which the stream may be crossed by a narrow bridge; that to the right conducts to a larger bridge which also spans the stream, on the other side of which a pathway ascends and joins that from San Bartolomeo, by which the return home may be made. Between *the two* bridges on the opposite side is another small olive mill

and a third mill a little way higher up the stream which may be visited before making the ascent to the upper path; here an aqueduct crosses the stream, which may also be used as a bridge, but it can only be reached through the mill. From this point there is a good view up the San Romolo Valley.

The Madonna del Borgo.—Ascend through the old town to the Madonna della Costa; continue on the San Romolo road for about half an hour, when the shrine with the broad blue border will be reached; from this a mule-path branches off on the left, leading gradually down into the valley. Follow this for about a quarter of an hour, when a small path will be noticed going still further down the valley at right angles with the mule-path; this in a few minutes turns somewhat sharply round to the left, and, after skirting a large reservoir, joins a small stream which runs for some distance between moist stone embankments, which are covered with Ivy and three different kinds of Ferns, including the Maiden Hair fern. This path in about fifteen minutes from quitting the upper path joins the lower mule-path of the San Romolo Valley; this on the right leads for two or three miles up the valley, and on the left, after passing the Chapel of the Madonna del Borgo, to the San Giuseppe gateway of the old town. In five minutes after passing the Madonna del Borgo, a small pathway is seen, which leads to an olive mill; from this there is a bridge, with, on the further side, some macaroni mills; the bridge cannot be crossed, however, as the mill is shut up, and access cut off from it by a gate which is kept locked. By continuing along the lower path for about another ten minutes, an aqueduct is seen which crosses the stream by a single arch and which leads to a picturesque old mill and water-wheel which is well worth a visit. Here the view up the valley is very fine, and the torrent, swollen by recent rains, rushes along with great force amongst the large boulders which obstruct its course. Near the mill-wheel and the mill itself I observed a greater variety of ferns than I have met with in any one spot elsewhere, the Lycopodium denticulatum being also found there. In place of recrossing the stream by the aqueduct, which is narrow and high above the water, it is better to take any small paths you can find, and to return on the western side of the valley; by the San Bartolomeo path the first part of this walk, notwithstanding the difficulty sometimes experienced of finding a foot-path, is particularly pleasant, as it abounds with a variety of wild flowers to a greater extent than I have hitherto seen. Here I found for the first time, on the 24th of March, many bushes of Coronilla Emerus L., in full flower. The macaroni mills may of course be reached from the San Bartolomeo path and the crossing of bridges thereby avoided.

The little excursion to the Madonna del Borgo is very pretty. and were it not for the steepness of the ascent through the old town and as far as the shrine, it would be an easy one; the walk through the valley is particularly pleasant; many flowers are seen, including the pure snowdrop-like and graceful Allium Neapolitanum, and the small Grape Hyacinth, both of which are met with in large quantities, as well as Borage, with its bright blue blossoms; the latter indeed occurs in most of the valleys. The Valley of San Romolo, when this excursion was taken, was at the height of its beauty, that portion of it near to the mule-path leading to San Remo abounding in Lemon trees laden with fruit, with Almond and other fruit trees then covered with their pink and white blossoms.

Instead of turning down into the valley by the pathway beside the shrine with the blue border, the walk may be extended by keeping along the San Romolo road for a greater distance before entering the valley; but since the prettiest part of this is along the lower mule-path, the easiest way is to make for this at once after emerging from the San Giuseppe gateway, the ascent to the Sanctuary being thereby avoided.

The Eastern side of the Valley.—Emerge from the old town by the Porta San Giuseppe, close to which is the church of the same name. From this point there is a good and tolerably level mule-path, which runs along the right side of the valley for two or three miles; this passes at first below the former Hospital for Lepers, and along its course at short intervals are a number of well-preserved shrines. In a few minutes the pathway leading down to the stream is seen, by which the short ascent was made after crossing the stream from the other side as described in the 'Walk on the Western side of the Valley;' continuing along the mule-path, in a few minutes more the Chapel of the Madonna del Borgo is reached; from this point the pathway winds along the valley for some miles, gradually ascending and disclosing many charming views of the torrent, of its rock-encumbered bed, and of the distant mountains. The pathway through this valley is one of the best I have met with, and, since it keeps for a long distance well down in the valley, the views obtained are of a different character from those of other valleys in which the pathways run on a higher level, and as there is not so much climbing the excursion is made with less fatigue. The whole route is very interesting. The San Romolo is the most considerable of all the valleys of the San Remo amphitheatre; the stream running through it is of greater volume, and its bed thickly strewn with huge waterworn boulders and masses of rock, brought down from the higher mountains by agencies far more powerful than any of those now in operation. Everywhere along the valley, the Lemon

tree is now, the 9th of March, seen bending under the weight of its fruit, as well as the delicate pink blossoms of hundreds of Almond trees, and occasionally the white blossom of Thorn and Cherry trees. Wild flowers are not so abundant in this as in some of the other valleys, but the scented Violet, the yellow Narcissus, the little Grape Hyacinth, with its fruity plum-like perfume, the blue Salvia, and some other kinds, are frequently met with.

San Romolo.—This is reached by the road which runs at the top of the ridge which separates the San Romolo and San Francia Valleys; in about forty minutes from starting the Chapel of San Giacomo is passed; a little further on the road leaves the San Francia and skirts the San Romolo Valley; the ascent is gradual and the road describes many turnings and windings, and several shrines are passed on the way. In about an hour and a half the last Olive trees are reached and are succeeded by a vegetation altogether different; the mountain sides are now clothed with Fir trees, the spaces between being thickly covered with Prickly Broom, Mediterranean Heath, Lentiscus, many trees of Blackthorn, so beautiful in the early spring, and a great variety of other shrubs and plants. The Prickly Broom here especially abounds, and it must be a glorious sight to see the mountain sides ablaze as it were with its golden blossom.

About half an hour before reaching San Romolo, a few scattered houses surrounded by Chestnut trees are seen on the other side of the valley: this is the hamlet Borello; it is reached by a pathway which leads down into the valley, crosses the San Romolo stream and in a few minutes brings you to the hamlet. Continuing on this pathway and leaving Borello on the left you reach in about a quarter of an hour a small open space where the road divides: the path to the right conducts to the Bevino spring; that to the left leads to the house which was once the residence of the late Dr. Rose. From the Bevino spring, San Romolo, San Bartolomeo, or Colla may be reached; keep up the hill for a few minutes, this will bring you to a broad mule-path which if followed on the right leads in half an hour to San Romolo and on the left to Colla, but it takes two hours to get to the latter place. The way to the Chapel of San Bartolomeo, which is situated on the ridge, separating the San Romolo from the Foce Valley, is not easy to describe clearly. Follow the broad mule-path just referred to on the left for about a quarter of an hour, then turn again to the left, when in half an hour you will come to a little hill where the path once more turns to the left, the descent to the Chapel from this point being very steep. But the places mentioned are not usually reached by the paths I have described; they are merely mentioned here as alternative routes, which may be taken should it be desired to vary the

excursions and travel over new ground. The excursion to San Romolo is usually made by the San Romolo road on which we were before taking the path down the valley leading to Borello, and it is reached in fact in about half an hour from that point. San Romolo lies at the head of the valley which bears its name and beneath the long ridge which unites Monte Caggio with Monte Bignone; it consists of an old and disused Convent, which commands a fine view of the San Romolo Valley down even to San Remo and the sea; of a small Chapel just below the convent, which marks the site of the cell formerly inhabited by the hermit Bishop of San Romolo, afterwards its patron saint, and of a few cottages and houses, one of which is the summer residence of the English Vice-Consul, Walter Congreve, Esq.

At the back of the Convent is a large space with many fine Chestnut trees; here the people of San Remo are very fond of coming in the summer to escape the heat of the town; they bring with them their tents and beds, placing the latter in the unused rooms of the Convent. There is an annual festival held here in memory of the Bishop of San Romolo.

The excursion to San Romolo, although long, is one of the finest in the neighbourhood of San Remo and the most frequently taken of them all, since it is by it that Piano del Rè is reached and Monte Bignone usually ascended. The time, I trust, is not very distant when there will be a good road to San Romolo, as there is to Ceriana; that which already exists is nearly broad enough for a carriage; such a road would afford a splendid drive and it would make the ascent of Monte Bignone so practicable that thousands would go up the mountain who now would never dream of making the excursion. In order to meet in part the expense of keeping the road in repair, a small toll might be levied upon all who use it.

Piano del Rè is the long and lofty ridge 3,500 feet in height, having to the north a large plateau at a much lower elevation, on which a king of Piedmont is said once to have encamped—hence the name. This ridge unites Monte Bignone on the right, and Monte Caggio on the left. From San Romolo two paths lead to the ridge; one goes to the town of Bajardo and the other to Perinaldo; the first passes to the right above the bridge before arriving at the Chapel, and where this path crosses the ridge it has received the name of 'Termini di Bajardo.' The other path commences behind the Convent, passes to the right, and where it crosses the ridge is called the 'Termini di Perinaldo.' There is also a path along the north side of the ridge, and after going along the Bajardo Termini for little more than half an hour, a plateau is reached on the other side of the *mountain, from* which there is a fine prospect. The ridge itself *commands* a splendid view of the mountains to the north of the San

Remo amphitheatre, including the snow-clad Alps. Fine as this view is, I will not stop to describe it in detail, as that from the summit of Bignone is far more extensive and glorious. Lying to the north of the ridge and below it at an elevation of 2,000 feet is a plateau, already referred to, of about two acres in extent, from which the Pine trees have been partly cleared away, and from this there are fine views; a visit to it is strongly recommended in Mr. Aspinall's little book. It faces due west, takes nearly an hour to reach, and is said to be now so overgrown that the prospect is not nearly so good as it was formerly. By continuing along the ridge and traversing it from one end to the other nearly the same views are obtained as from the plateau itself.

Monte Bignone.—The ascent of Monte Bignone is most frequently made by the Bajardo Termini which, passing to the right, gradually ascends to the top of the mountain. In making the ascent for the first time it is always safest to be accompanied by a guide; for those who are strong the ascent on foot is the pleasantest, but the road is quite practicable for sure-footed donkeys, although in places it is somewhat trying for those whose nerves are not strong. The whole route is exceedingly beautiful, glorious prospects meeting the eye at almost every turn; the path sometimes traverses forests of Fir trees, with amongst them innumerable bushes of the bright-leaved Holly; at others it runs along the edges of steep ravines; many curious and rare wild flowers attracting the eye on the way; till at length after an ascent of about two hours from San Romolo and four from San Remo, the broad, sloping and grassy summit of the mountain is reached. Continue the ascent until its highest point, marked by a stone obelisk, is gained, and from which one of the most magnificent prospects imaginable lies stretched out on all sides, embracing an area in some directions of more than a hundred and fifty miles, astonishing and enchanting the beholder. To the south, the glorious expanse of the Mediterranean and in the far distance the island of Corsica with the snowy peaks of Monte Rotondo; on the right Monte Caggio, and the mountains forming the western half of the San Remo amphitheatre, terminating at Capo Nero surmounted by Colla, and the valleys of San Remo and Bordighera; further away, the mountains of the Mentonean amphitheatre, and along the coast successively the various capes and promontories as far as Cap d'Antibes and even the Esterels: on the left the Ceriana and Taggia Valleys, with on the further side of the latter Castellaro and the Madonna di Lampeduza, and Pompeiana and Riva on the sea-shore; while far away to the east are the mountains of the Eastern Riviera, Riviera di Levante, and the Apennines beyond Florence: lastly, to the north is a broad and deep valley, with on the other side a range of mountains still loftier than the one on which we are standing.

and above these again, the snow-capped Alps stretching away in the one direction towards the Esterels, and in the other to Turin. Looking now more closely into the valley below, on a narrow ridge on the near side of the valley and to the left is seen the town of Perinaldo, the birth-place of Cassini, the discoverer of the satellites of Jupiter, and on a hill on the opposite side, Apricale; both of a singularly deep red hue, from the fact that the tiled roofs only of the houses are seen from this great altitude. The town of Bajardo, lying more to the right, on the side of a hill, is not visible from this point of view, although it is so from the plateau, Piano del Rè. From Bajardo there is a pathway to Pigna, where accommodation at a small but clean inn may be had for the night; the return home can then be made by the Nervia Valley and Bordighera, altogether a most beautiful and varied excursion.

It is impossible to convey in words anything like a correct idea of the splendour of the prospect on a clear day from Monte Bignone; it must be seen to be appreciated; it has been described as one of the finest in Europe. The excursion is one which may be safely undertaken with ordinary precautions and is within the compass of any person of fair health and strength. An additional charm consists in the number of rare and beautiful wild flowers, which are different from those found at a lower elevation. Amongst the most noticeable of these is the blue Hepatica, Anemone Hepatica L., a pink variety of which is sometimes met with; the pink cyclamen-like flower, Erythronium Dens Canis L. with its trefoil-like and spotted leaves; in shady places the Primrose, Primula acaulis All.; everywhere over the summit of the mountain the Cowslip, Primula veris; two species of Gentian, Gentiana verna and G. acaulis L.; Ophrys fusca Link, also a species of Asphodel, Asphodelus albus Willd., which however was not in blossom at the time of my visit; Saxifraga cuneifolia; Sempervivum arachnoideum L.; and lastly, in shady dells, Daphne laureola L. With two or three exceptions, these flowers were found in blossom at the end of April, but they had been so for some weeks previously. On my way up the San Romolo Valley I noticed many plants of Helleborus fœtidus L.; as also for the first time in flower, the large and handsome pink Cistus, C. albidus L.; this is the species which is so commonly found above the region of the Olive trees, which by its abundance helps to clothe the rocks in many places, and when in full flower it must present a very handsome appearance.

The descent was made by the ridge of Il Poggietto, the Croce di Parà, and the Chapel of San Pietro, San Remo being entered by the Via Francia which runs beside the Madonna degli Angeli. The scenery is very beautiful all the way, the view across the *valley of San* Martino of Verezzo with its churches being par-

ticularly pleasing. The descent of Monte Bignone is not unattended with risk, and severe falls are frequent; the safest course is not to ride, but to walk down the roughest and steepest places. The donkey men, whenever they can, send boys with you instead of going themselves.

THE FOCE VALLEY.

Chapel of San Bartolomeo—Chapel of San Lorenzo—Descent of the Mossè and Foce Valleys—Walk in the Foce Valley.

The next valley to the west is the Foce or Lemon Valley; on the ridge separating this from the San Romolo Valley stands the Chapel of San Bartolomeo, and hence the first excursion described in connection with the Foce Valley will be to the Chapel of that name.

Chapel of San Bartolomeo.—Ascend to the Rondo at the east end of the Berigo road, either by the Public Garden or the Via Costigluoli, take the path which leads past the small shrine containing a figure of the Virgin in marble; this very soon passes behind a castellated house, and after a short and somewhat sharp ascent turns abruptly off to the left. From this point, as already stated, one of the best views of San Remo, the Madonna della Costa, and the former Hospital for Lepers is obtained, together with Capo Verde, the Madonna della Guardia and the hills and mountains forming the eastern boundary of the San Remo amphitheatre. In a few minutes a path on the right leads into the San Romolo Valley, and almost immediately after another path is given off on the left, going apparently into the Foce Valley; then a shrine is noticed on the right, and in about five minutes afterwards a second shrine, near to which on the left-hand side is the ruined house referred to in the description of the return journey from San Lorenzo. From this there is a fine view both right and left of the bay of San Remo, of its two promontories, of its encircling amphitheatre of hills and mountains and of the towns of San Remo and Poggio. In a few minutes more, the mule-path divides, the left hand or smaller division leading into the Foce Valley, and being the path by which the return from San Lorenzo is made; while the other or main division leads to San Bartolomeo; this makes a sharp ascent somewhat to the right, and very soon a shrine is seen on the left, shortly after passing which there is a very excellent view of both the Foce and San Romolo Valleys, the ridge in this situation being very narrow; another path descends into the latter valley, the ascent again becomes steep, terminating in a few minutes at the *Chapel of San*

Bartolomeo; the journey thus far having occupied, with some short delays on the way, about an hour and a half. Looking across the Foce Valley the Chapel of San Lorenzo is seen, and across the San Romolo Valley that of San Giacomo. In about ten minutes from the Chapel a path branches off on the left to the Foce Valley, the main pathway ascends and from it in the course of a few yards another path leads into the San Romolo Valley; the path now becomes very rocky and rough, and in a quarter of an hour or twenty minutes a hill is reached from the back of which there is a grand view of Bignone and of the other mountains of the San Remo amphitheatre, rendered more striking and imposing when the dark shadows of evening gather upon them. The wide valley of San Romolo is seen to great advantage for nearly its whole length, with San Remo occupying a conspicuous position at its termination. The further you proceed on the mule-path the wilder and grander the scenery becomes, and by it San Romolo may be reached on the right, or Colla on the left. Above the Olive trees the summits of the hills and spurs of the mountains are more or less bare, and it is then seen that some of them are of the schistous formation, the strata in many cases being placed almost vertically.

Chapel of San Lorenzo.—Take the mule-path on the eastern side of the Hôtel des Anglais. The ascent is steep at first; in a few minutes you observe on the left a small Chapel and house partly in ruins; just past the Chapel two paths are seen on the left going down into the valley of Bernardo, and then another to the right which descends the Foce Valley. Keep straight on; in about a quarter of an hour a shrine is reached on the left and a mule-path branches off down the Foce Valley bearing in the direction of Colla. Do not take this however, but go on, and in a few minutes more Colla is seen, apparently but a very little way off; almost immediately is a second shrine on the right, soon after passing which a tolerably good path is observed running down the Foce Valley, and from that point there is a good view across the valley and of the Church of San Bartolomeo on the other side. The mule-path now bears somewhat to the left in the direction of Colla, and skirts the Bernardo Valley; in less than five minutes a good path branches off still more to the left, the original mule-path, which should still be followed, now ascends a little to the right; after a few yards a good path leads gently down the western branch of the Foce Valley; this has received the name of the Mossè Valley, it being separated from the other branch of the Foce Valley by an intervening hill or spur. In a few minutes the very pretty and beautifully situated little Chapel of San Lorenzo is reached, the ascent to which on foot occupies about three-*quarters of* an hour from the Genoa road; there is a still better

view from here of the Chapel of San Bartolomeo and also of the Bernardo Valley and Colla. Just past the Chapel there is another path leading down the Mossè Valley, and a few yards further a shrine on the left with a well executed painting; just beyond this another very good path branches off on the left, going down the Bernardo Valley; the mule-path, which now ascends sharply bearing to the left, passes over masses of rock almost too rough even for a mule. After an ascent from this point of about a quarter of an hour a rocky plateau is reached, and from this there is a glorious view both right and left, embracing the whole of the San Remo amphitheatre.

This view is well described by Mr. Aspinall. 'As almost all the hills and valleys lying round San Remo are seen from this point, it will be a good place to specify their names. You are standing with your back to Piano del Carparo, on one of its spurs, —the one which divides the valley of the Bernardo on the right, from that of the Mossè on the left; the next spur divides the Mossè from the Foce; it is short and at its foot the two valleys join into one. Piano del Carparo leads up to Monte Caggio, Monte Caggio to Monte Bignone. The deep valley which runs from Bignone to the sea is the valley of San Romolo; the hill bordering it, on its further side, is Campo Bandito: this hill divides the valleys of San Romolo and Francia. Then comes Il Poggietto, separating the Valle di Francia from that of Bestagna; the next ridge is Monte Colma, enclosing the further side of the Martino Valley; one of the three valleys which run the whole way from the sea up to Bignone. (San Romolo and Ceriana are the other two.) The peaks rising beyond this again, are those of Monte Lona, lying at the head of the Taggia Valley; Monte Panizzi, Monte della Croce, and Monte Calvo; they slope down to the sea, which sweeps round from here back to Monte Corvi and the furthest spur of Piano del Carparo, behind which the pyramidal head of Monte Nero raises itself, completing the panorama.

'The towns are San Remo, of which you only see the highest part, Bussana on Monte Panizzi, Torsorio far away on a spur of Monte della Croce, and Colla on the furthest spur of Piano del Carparo.

'The Chapels are San Bartolomeo, San Romolo, San Giacomo, Villetta, and the Madonna della Guardia, to the left; while to the right, are the Madonna di Bonmoschetto, and a little higher up, San Bernardo.'

The above description, excellent and accurate as it is, applies obviously to the view as seen from a point much below that which I reached, and from which were visible on the left the white tower on the ridge of Poggietto, the Croce di Parà, and what appeared to be the square tower of Poggio, and on the right Colla lying far

below with the road leading to Ospedaletti, Capo Nero and the mountain range beyond. The view here was truly grand, and I left it with great reluctance. The smell of Wild Thyme filled the air, the loud humming of bees was heard, and once more our old but vigorous friend the 'Red Admiral' made his appearance, as well as the ever active Humming Bird Moth. The mule-path seemed still to go on and on, ever ascending, making apparently for the summit of the higher mountains, which, had time and strength permitted, I too would have gladly scaled.

Descent of the Mossè and Foce Valleys.—Descend the hill by the same path, to where the branch is given off which leads down into the Mossè Valley and which should now be followed. In a few minutes the stream is reached; pass over this and ascend the opposite bank, crossing the spur which separates the Mossè from the continuation of the Foce Valley, and descend to the Foce stream or torrent, which you cross by a high single-arched bridge. Ascend on the other side and follow the mule-path which goes down the valley and from which many pleasant peeps are obtained across the valley and down to the sea.

In about half an hour after crossing the Foce torrent the mule-path divides, the branch on the right traversing the ridge which separates the Foce and San Romolo Valleys and leading up to San Bartolomeo, while the continuation of the mule-path passes by the ruined house on the right, which was noticed particularly in the excursion to San Bartolomeo, and from this it runs on to the Strada Berigo, from which the descent may be made by the Via Costigluoli of the old town. Descending through this the Genoa road is gained just opposite the Subprefecture. The walk through the Mossè and Foce Valleys is a very charming one; wild flowers in abundance are met with, including the Scarlet Tulip, T. Præcox; the mauve Anemone, A. stellata; the Oriental Hyacinth, and countless Violets. The terraces here, as in most of the other valleys, are thickly covered with the bright green, self-sown Oat, which is now being cut down in large quantities and used as fodder for cattle.

When we see the vast profusion in which wild flowers grow in some of the valleys, but little apprehension need be felt of their extinction by gathering them for sale; it seems that they suffer to a much larger extent by the digging up and planting of the terraces, when enormous quantities of bulbs and roots are frequently removed and destroyed. The excursion as far as San Lorenzo is a tolerably easy one, but it should be made by invalids on a donkey; the descent by the Mossè and Foce Valleys is also by no means difficult.

Walk in the Foce Valley.—Leave the Genoa road by the turning which runs between the new West End Hotel and its

Dependance; follow the pathway at the back of Villa Congreve which gradually ascends until it passes the Villa Evelina, distinguished by its statues, close to which it joins a mule-path running right and left. Turning to the right the path, after passing a number of villas, brings you in the course of a quarter of an hour to the Via Costigluoli by which the old town is entered; but following it on the left, it terminates in about twenty minutes in the Foce stream, which here can be crossed by stepping-stones unless the stream be swollen by heavy rains. Just before the path descends to the stream another path is given off from it; this after ascending the valley for a short distance, also goes down to the stream, which in this situation can be crossed even more easily; there is a pathway on the other side by which the mule-path from San Lorenzo may be reached in a few minutes. This walk in the Foce Valley is very easy and really beautiful, the Olive trees are fine, some of them very ancient and curious, and Lemon trees interspersed with a few Orange trees abound; the stream itself is also picturesque. A number of small pathways are seen running in different directions, some higher up the valley, and which if followed would no doubt bring the pedestrian to many a pleasant nook. This is the most suitable walk amongst the Olive trees for invalids residing on the west side of the town.

(Owing to the construction of the Berigo road, the mule-path referred to in the above description, as running right and left near the Villa Evelina, has been done away with, the carriage road taking its place and for some distance following much the same course. Access to the valley is now more difficult, but there is still a foot-path near the western end of the Berigo road, which branches off on the right and leads into the valley.)

THE BERNARDO VALLEY.

Chapel of San Bernardo—Madonna di Bonmoschetto—Colla.

This is the last of the three valleys on the west side of the town: it is very open, its western boundary being formed by the ridge which terminates in Capo Nero; high up on this stands the town of Colla, which may be reached either by the now well-known carriage road commencing on the west side of Capo Nero and near to Ospedaletti, or by two mule-tracks; the steepest but most direct way for pedestrians is by the mule-path seen immediately after passing the Villa Luigia Ponente; the other way is by the mule-path which starting from the eastern side of the Hôtel des Anglais passes the little Chapel and ruined house and runs along the ridge which separates the Bernardo and Foce

Valleys; at the first shrine which is passed on this ridge, a path is given off which descends into the Bernardo Valley and runs in the direction of Colla, and it is this which should be followed if this second route be selected. Usually, however, as already stated, the ascent is made by the steeper and more direct way and the return by the ridge above referred to as separating the two valleys.

On the last occasion when I made an excursion in the Bernardo Valley, as the object was to see as much of the valley as possible, the pathway was taken which branches off from the ridge soon after passing the second shrine. Following this, after a steep ascent, the road bore to the left and, on turning round, a fine view was obtained from this point across the valley, of Capo Verde, of the Madonna della Guardia and of the bay of San Remo. The path then turned to the right and higher up Bussana came into view; but as the pathway continued to ascend apparently leading up into the mountains, and as Colla lay now some hundred feet below and behind us, the mule-path was abandoned and the head of the valley was crossed by small branch paths not available for mules, and in a short time the broad mule-path behind and above Colla was reached.

This path, which was very steep and rough, was ascended for some distance, in fact until it divided into two, one division leading to the right and apparently running across the head of the Bernardo Valley, and the other on the left, traversing a mountain ridge running in the direction of Ospedaletti. From this point, as also lower down and near to Colla itself, the views are very extensive. On the right, Cap Ampeglio crowned by the old town of Bordighera, and the bay and amphitheatre of Ospedaletti are seen, and some hundred feet below, Colla, Capo Nero, the *Chapel of San Bernardo* and on the left the valley of Bernardo, San Remo, Capo Verde, and the mountains forming the eastern boundary of the San Remo amphitheatre with Bignone to the north. The descent was now made to Colla, which will be separately noticed.

In order to vary the route and explore the Bernardo Valley still further, the descent was made by a very rough and small pathway immediately to the east of Colla. This path was soon lost and the descent of the valley was effected by various other footpaths, and a mule-path was at length reached which after a short time passed the Chapel of the *Madonna di Bonmoschetto*, and in a few minutes terminated in the Genoa road some little distance to the west of the mule-path near the Villa Luigia Ponente by which the ascent to Colla is usually made.

In different parts of this valley wild flowers abound, including *the blue* variety of Anemone coronaria L., and the scarlet and

mauve varieties of Anemone hortensis; also the very pretty blue Nectaroscilla hyacinthoides Parl., with its delicate almond-like odour.

The ascent to Colla, which is 1,000 feet above the sea, by the path to the west of the Villa Luigia Ponente, is particularly steep and the path itself full of rocks, boulders, pits, and holes, and is in fact as rough and rugged as it well could be. After ascending for a little time the view becomes very pretty. On the right you look down into the Foce Valley, while to the left there are charming peeps of the sea. As you near Colla the valley of Bernardo opens out, and, looking towards the east, a really fine view of the surrounding amphitheatre of Olive-clad hills and Pine-covered mountains is obtained. Entering the town, which is situated on one of the spurs of Piano del Carparo, and which is reached from San Remo after about an hour and a half's climbing, it is found that Colla is composed of an aggregation of closely built houses, without order or beauty, and, like most small Italian towns similarly situated, remarkable for the narrowness of its streets, their dimness, the number of arches thrown across them, and the steepness of the staircases.

Colla, however, strange to say, possesses a collection of paintings bequeathed to the town by Professor Rambaldi, a native of Colla, and this is well worth a visit; it includes some original pictures by Nicholas Poussin, Gaspard Poussin, Paul Veronese, Salvator Rosa, Domenichino, and Carlo Dolce. There is also a library of over 6,000 volumes, a gift to the town from the same benefactor. Visitors should not omit to see the Sacristy of the parish church, where is the large and beautifully carved ivory crucifix, the legacy of Monsignor Stefano Rossi, also a native of Colla, or Colle di Rodi as it is sometines called.

The town is a very much larger place than would at first sight be supposed, and although in its present condition it is unattractive, it yet might with a little outlay be greatly improved. It occupies a commanding situation; the prospects around are extensive and beautiful, and facilities exist for the making of one or two terraces and promenades which would be of the greatest possible benefit to the inhabitants and which would serve to attract visitors to the town. The carriage road having been completed Colla has now become readily accessible, and the views from it will doubtless prove as attractive as those from Poggio and the Madonna della Guardia.

At a short distance from Colla, on the ridge which terminates in Capo Nero, is the Chapel of San Bernardo, and behind this runs a mule-path leading down to Ospedaletti. From this Chapel one of the best and most favourable views of Colla, with its encircling mountains, is obtained.

The mule-path which leaves the town on the north and ascends the side of the mountain presents a very inviting appearance to a strong and adventurous climber; this is the path by which Colla was entered on the way back from the excursion up the Bernardo Valley. Steep and trying as the ascent to Colla is, the descent by the same path would be even more fatiguing; it is well therefore to return by another road. At the corner of the principal church is a fountain from which the inhabitants derive their supply of water, and the overflow of which escapes as a small stream down a pathway or mule-track to the right of the church. Follow this, it leads across the head of the Bernardo Valley for about ten minutes, when you come to a small stream over which you cross by an arch; continue on the same track for about five minutes more, when you cross another stream with a water-tank for irrigating purposes close to the path. This now turns to the right and after a time skirts for some distance the eastern side of the Bernardo Valley; after about twenty minutes the rough mule-path which we have hitherto followed makes a sharp and very steep ascent to the left; this leads up to the Chapel of San Lorenzo, which however is not visible from the path. Be careful not to ascend this, if it be desired to return direct to San Remo, but follow the path on the right, which, narrow at first, afterwards becomes a regular mule-track and which evidently leads downwards. After a time the western side of the Foce Valley is reached, along which you continue until you arrive at the Genoa road close to the Hôtel des Anglais.

Very noticeable features in the Foce Valley as seen on the return journey are the small houses and buildings scattered about in different directions, each of these being distinguished by one or more of those stately Pyramidal Cypresses, which are so conspicuous in the scenery of the Riviera, and which seem to stand about buildings like landmarks to point out the way to the traveller.

We started for Colla at two o'clock in the afternoon, and on the way back it became dark before reaching San Remo. On nearing home and looking across the Foce Valley, on the edge of the ridge separating it from the San Romolo Valley, a limited red glow was observed like that which precedes the rising of the sun or the reflected light which is sometimes seen in the east on its setting. It was thought it might be the glare of a mountain fire, but in a few minutes the cause became apparent, the full moon rose slowly and grandly behind the hill, unobscured by a cloud and shedding around it such a flood of light as to illuminate the surrounding hills and mountains and to bring their outlines clearly into view, a panorama of exceeding loveliness being disclosed.

The above comprise all the excursions proposed to be given, *following* the coast westward. A great variety of other very

beautiful or interesting excursions may be made, and towns visited, either on foot, by carriage, or by railway, as the following : To the newly created town of Ospedaletti ; to Bordighera, renowned for its palms ; to Dolceacqua, with its sulphur springs ; to the curious and ancient frontier town of Ventimiglia ; then to Mentone, with its picturesque mountain peaks and its Lemon trees ; to Monaco, so trim and well kept ; to Monte Carlo, which grows and flourishes apace as a health resort notwithstanding, and perhaps partly in consequence of, the indiscriminate attacks to which it has been subjected ; to the fair and beautiful city of Nice, with its Carnival gaieties ; to wealthy and ever-increasing Cannes ; and lastly, to St. Raphael, one of the latest candidates for the favour of the winter visitor, but more suited, however, to a summer resort. These and many other places and excursions will be found described in my work entitled ' San Remo and the Western Riviera.'

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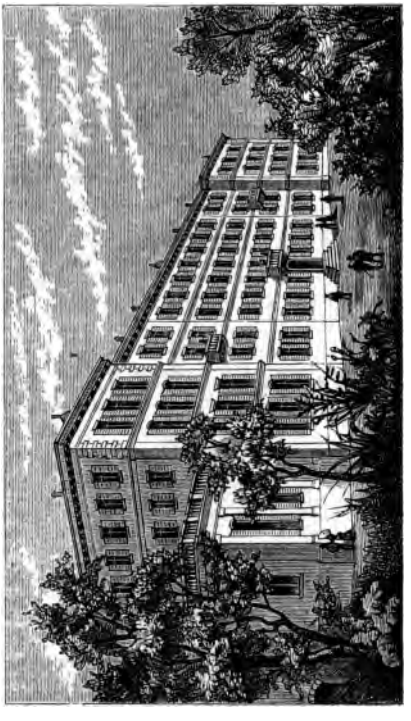

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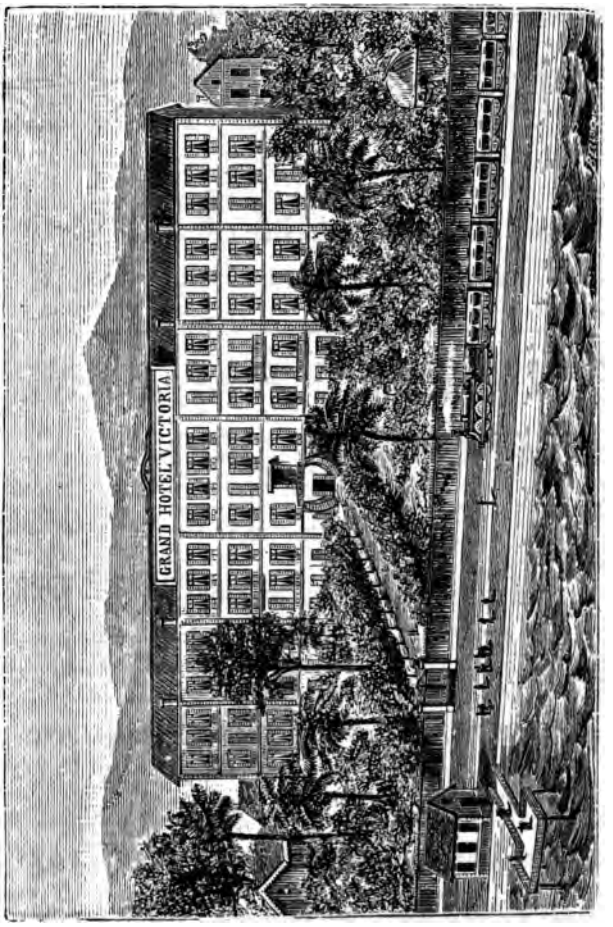

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N.B.—*A Free Omnibus will be at the service of the guests every Holy Day for the English and Scottish Churches.*

GRAND HOTEL ROYAL,

SAN REMO.

FIRST CLASS HOTEL, PATRONISED BY ENGLISH VISITORS.

Full South, beautifully and healthfully situated.
Commanding magnificent Views of the Town and Sea.

Fine Garden (16,000 square yards) with a good Lawn Tennis Court.

The Hotel is kept by the well-known Proprietor of the HOTEL ROYAL, COURMAYEUR (Vallée d'Aoste).

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WEST-END HOTEL.

ONLY HOUSE WITH LIFT.

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Au centre de la ville, au milieu d'un vaste jardin anglais, à l'abri des vents.

Inauguré en 1874 par S. A. le Prince de Hohenzollern, et choisi pour le séjour de S. M. I. l'Impératrice de Russie, l'hiver 1874–75.

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ON PARLE ANGLAIS.

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